— LATIN AMERICA @ WAR No.5 —

THE FIRST MODERN AIR WAR IN LATIN AMERICA

THE CHACO AIR WAR

1932-35

ANTONIO SAPIENZA

LATIN AMERICA @ WAR SERIES

Helion & Company Limited
26 Willow Road
Solihull
West Midlands
B91 1UE
England
Tel. 0121 705 3393
Fax 0121 711 4075
email: info@helion.co.uk
website: www.helion.co.uk
Twitter: @helionbooks
Visit our blog http://blog.helion.co.uk

Published by Helion & Company 2018
Designed and typeset by Farr out Publications, Wokingham, Berkshire
Cover designed by Paul Hewitt, Battlefield Design (www.battlefield-design.co.uk)
Printed by Henry Ling Limited, Dorchester, Dorset

Text © Antonio Luis Sapienza Fracchia 2018
Illustrations © as individually credited
Color profiles drawn by Tom Cooper © Helion & Company Limited 2018
Maps drawn by George Anderson © Helion & Company Limited 2018

ISBN 978-1-911512-96-7

British Library Cataloguing-in-Publication Data
A catalogue record for this book is available from the British Library

All rights reserved. No part of this publication may be reproduced, stored, manipulated in any retrieval system, or transmitted in any mechanical, electronic form or by any other means, without the prior written authority of the publishers, except for short extracts in media reviews. Any person who engages in any unauthorised activity in relation to this publication shall be liable to criminal prosecution and claims for civil and criminal damages.

For details of other military history titles published by Helion & Company Limited contact the above address, or visit our website: http://www.helion.co.uk

We always welcome receiving book proposals from prospective authors working in military history.

CONTENTS

Foreword 2

Introduction 3

1 The theatre of war 3

2 The conflict background 5

3 Paraguayan Military Aviation 6

4 Paraguayan Navy and Naval Aviation 13

5 Bolivian Military Aviation 16

6 Chaco air war chronology 22

7 Conclusion 54

Appendices

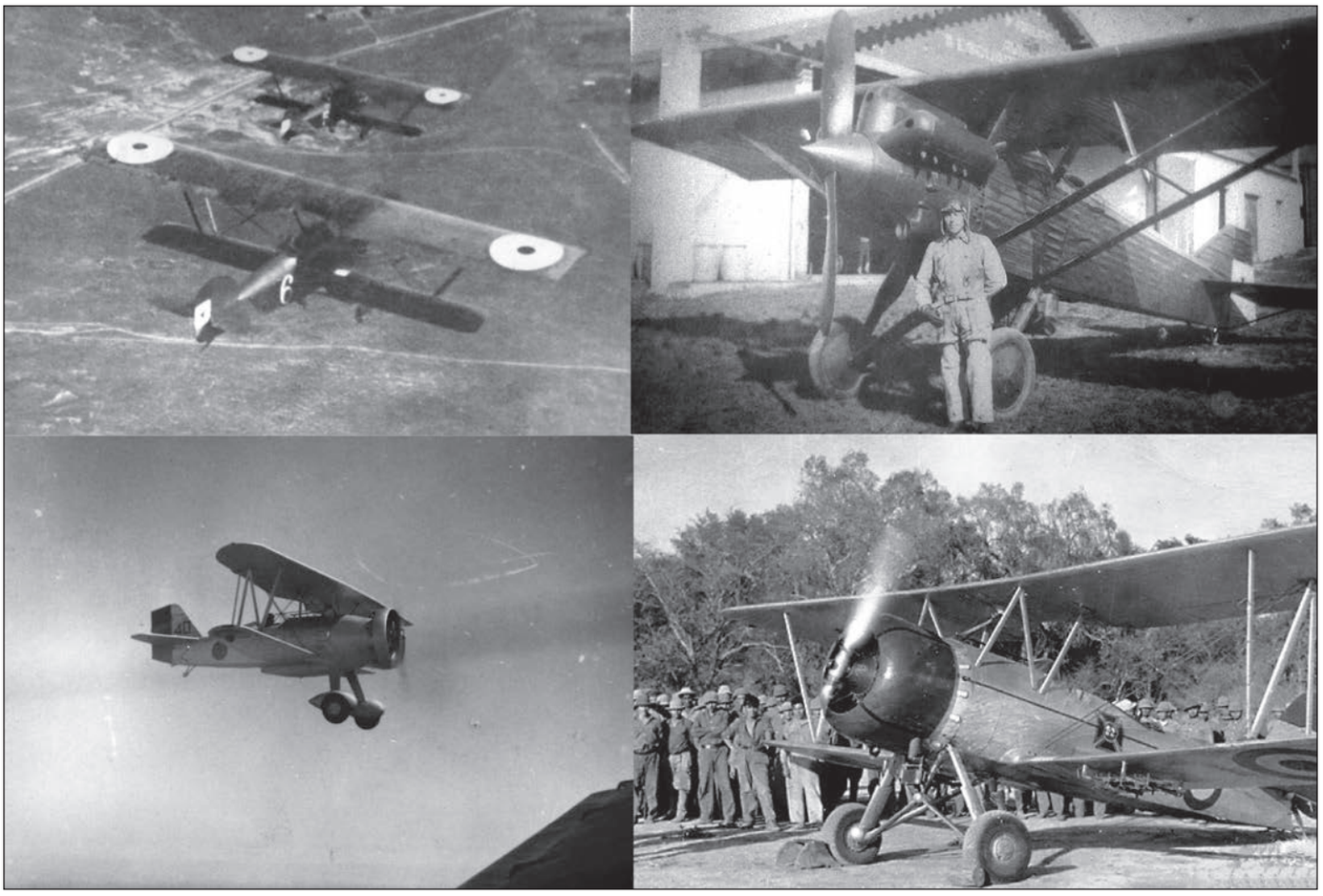
I Recce flights carried out by the Paraguayan Air Arm during the Chaco War 57

II Chaco War Aircraft Fleets 58

Sources 62

Acknowledgments 64

About the author 64



FOREWORD

As the author of one of the very few English language histories of the Chaco War, I am extremely flattered by being asked to write a prologue to what must be the definitive history of the aerial aspects of that conflict, not only in English but also in any language.

Its author, Antonio Luis Sapienza Fracchia, who has already published a detailed account of the aircraft involved in that conflict, is also the official historian of the Paraguayan Air Force and enjoys an international reputation as an authority on Paraguayan and Latin American aviation in general.

Paraguay, probably the least known country in the Western Hemisphere, occupies a disproportionate position in its military history, having taken part in two of the only three major conflicts between Latin American nations during their two centuries of independence.

The first of these, the brutal war of the Triple Alliance (1864–70), when it took on an unbeatable combination of South America's two most powerful nations, Argentina and Brazil, plus Uruguay, must rate as one of the bloodiest in world history, almost resulting in the disappearance of Paraguay as an independent entity. It had scarcely emerged from its results when it found itself pitted against Bolivia, a country of three times its human and many times its material resources, in the Chaco War. Almost incredibly, despite a few minor reverses, it emerged victorious.

Both conflicts had an aerial dimension, even if in the Triple Alliance War it only consisted of the use of revolutionary observation balloons by its most powerful enemy, Brazil. In the Chaco War, although against less obscenely overwhelming odds than which it had faced only 60 years earlier in the Triple Alliance War, Paraguay met an adversary that was in all respects better equipped, especially its formidable air force. Yet from the outset it assumed and for the most part retained the initiative, its relatively tiny military and naval Air Arms both punching way above their weights and the latter making history with the first nocturnal bombing mission in the Western Hemisphere. In this respect, however, it was merely following in a tradition when an aircraft of the government faction, flown by an Irish mercenary, won the first aerial dogfight in the Americas when it vanquished a rebel aircraft – also flown by a mercenary, but in this case Italian – flying on behalf of the rebels in the Civil War of 1922–23.

Although already familiar with the Chaco War, in which I have had an almost obsessive interest for more than 50 years, I learned much from this book, which I devoured in a single reading. I unhesitatingly recommend it, not only to those interested in this relatively obscure conflict or in Latin American military history in general but also to anyone with an interest in aerial warfare during its formative phase: the first three decades of the 20th century.

Adrian J. English

INTRODUCTION

Since the end of the Chaco War, more than 80 years ago, only a few books have covered the conflict's air operations. The first books on the subject were written by veteran pilots: Major (Ret.) Leandro Aponte and Captain (Ret.) Abdón Alvarez Albert in Paraguay, and Colonel Amalia Villa de la Tapia and General Alberto Paz Soldán in Bolivia. In the early 1990s, since some of the Chaco War pilots and mechanics were still alive and willing to share their stories, I interviewed them extensively and also reproduced hundreds of never-before-published pictures. The result was a volume co-written with Daniel P. Hagedorn and published by Schiffer Publishing Company in 1996 called *Aircraft of the Chaco War, 1928-1935*.

By the 2010s, all the aviation veterans from that time had already gone, both in Bolivia and Paraguay, but in the last 20 years, new pieces of information and many more pictures were discovered in personal files and also in the Paraguayan Ministry of Defense. The original idea was to publish a completely new book in my own country, in Spanish, but unfortunately it was not possible, so once again I turned to the international market.

First, the reader will find a brief description of the war setting, the Chaco, followed by information on the aerial explorations performed by the Bolivian Military Aviation before the war. The following chapter is devoted to the organisation of the Bolivian and Paraguayan Military Aviation before and during the conflict, including aircraft acquisition, pilot and mechanic training, air bases and so on. Then there is a complete chronology of the pre-war period (1923–32), the war itself (1932–35) and the immediate post-war period (1935–39). For the first time, all the air combats, no more than 20, are described exhaustively, including detailed information on the participants, aircraft involved, pilots, location and the final outcome. The book also covers bombing, reconnaissance, medevac, liaison and transport missions during the war. In the post-war period, all aircraft purchased by both countries are detailed, and as a conclusion, a final balance of the air war is presented. The initials PAM (*piloto aviador militar*, military aviator pilot), PAN (*piloto aviador naval*, naval aviator pilot), MAM (*mecánico de aviación militar*, military aviation mechanic), Obs. Aer. (air observer-gunner) and HC (*honoris causa*) are used together with the military rank to identify the role in each mission.

From left to right: First Lieutenant PAM Walter Gwynn, Captain PAM Leandro Aponte and Second Lieutenant PAM Gregorio Morínigo with some Wibault 73 C.1 fighters at Isla Poi AFB in September 1932. (*Instituto de Historia y Museo Militar del MDN*)

The Chaco War was probably the first 'modern' conflict in Latin America where military aviation was widely used in all roles. Bolivia, as the reader will find out, had a very powerful military aviation, but unfortunately for them and luckily for Paraguay, its high army command did not take advantage. The Paraguayan commander-in-chief, General José Félix Estigarribia, used military aviation to help him defeat the enemy on the ground, and the result was clear: the Bolivians were expelled from the Chaco after three years of war.

Antonio Luis Sapienza Fracchia
Asunción, August 2016

CHAPTER 1

THE THEATRE OF WAR

The Chaco has a length of approximately 1,500 kilometres from north to south and a width of 700 kilometres, making a total area of 1,000,000 square kilometres. This region is divided into three sub-regions: the South Chaco, between the Salado and the Bermejo rivers; the Central Chaco, between the Bermejo and the Pilcomayo rivers, both regions in Argentina; and the North Chaco, between the Pilcomayo, the Otuquis, the Parapití and the Paraguay rivers, the Aguaragué mountain range and the Izozog wetlands, 90 percent in Paraguay and the rest in Bolivia. It was in the North Chaco that the war took place between 1932 and 1935.

The North Chaco is a vast plain without navigable rivers of about 260,000 square kilometres and it is divided into two different regions: the High Chaco, with thick forests and low rainfall, and the Low Chaco, an immense arid prairie with palm trees, grasslands and some estuaries, also with low rainfall. Temperatures in summer normally reach 40–45°C in the shade, and more than 50° in the sun, with hot north winds. In winter, the temperature can easily drop to -3°C at night, with strong south winds. The vegetation is typical of arid zones, with a lot of cacti, which saved many lives during the war because soldiers drank its sap when they did not have access to fresh water.

The diverse wildlife in the zone includes the jaguar, puma, wild boar, crocodile (in the estuaries), many species of snakes, some of them extremely poisonous, and an ample variety of insects and

Life at Isla Poí AFB. Clockwise: Captain PAM Carmelo Peralta and Second Lieutenant Obs. Aer. Gonzalo Palau having lunch. A platoon honouring the flag in front of the commander's office and other buildings. Lieutenant PAM Ruffinelli and Urbieta Rojas (centre) studying a map for the next sortie, with three soldiers and Captain Obs. Aer. Job Von Zastrow on the right. A tent used as a pilots' dormitory. (*Instituto de Historia y Museo Militar del MDN*)

Three *Potez 25A.2* bombers at Isla Poí air strip with the personnel assigned to that AFB. (*Instituto de Historia y Museo Militar del MDN*)

birds. In the deep Chaco, the only inhabitants were the aborigines of different ethnicities, military personnel, and Mennonite settlers, who colonised the central region in the mid-1920s. On the west bank of the Paraguay River, there were many ports where international companies, mainly Argentinean and American, built factories after purchasing millions of hectares of virgin forest to extract the tannin; one of them even built a 145 km railroad that became invaluable for the Paraguayan Army and aviation later. Many have identified the Chaco as the 'Green Hell' and almost all agreed that thirst, lack of food and several diseases killed more soldiers than the bullets.

Air navigation in the Chaco was also difficult. From the air, it was like flying over an immense green ocean, with few points of reference. Both military Air Arms had to elaborate maps and pilots had to rely on their instruments because of the lack of radiotelephony equipment on their aircraft. In the case of Paraguay, such equipment was acquired to be used in the *Potez* bombers, but they were never installed and were used instead as army land equipment. At the beginning of the conflict, logistics was more difficult for Bolivia since its aircraft had to travel at least 1,200 kilometres and cross the Andes to reach its main bases in the Chaco. The Paraguayan Air Arm needed to cover only approximately 300–400 km from Asunción or Concepcion AFB.

Aircraft maintenance was a nightmare for both countries. The dusty environment caused a lot of engine problems, which had to be overhauled more frequently. Most Bolivian planes had air-cooled radial engines, which was an advantage in the Chaco, but the main Paraguayan types had water-cooled ones. During the very low temperatures in winter, water had to be removed from the radiators at night, otherwise it froze. Early in the morning, the radiator water had to be warmed. Minor repairs were carried out in the main air bases in the Chaco, but when major repairs or overhauls were needed, the Paraguayan aircraft were sent to Asunción, and the Bolivian aircraft were sent to Villamontes or Santa Cruz de la Sierra. The rough conditions of the air strips caused many accidents, together with the marginal weather conditions. More airplanes were lost because of those reasons than in air combat or anti-aircraft fire.

Air strips were normally prepared by removing trunks, stones and low vegetation on a flat piece of land and were around 1,200

metres long by 100 metres wide, in north–south orientation, because of predominant winds. A few rudimentary constructions with adobe walls and straw roofs or large tents were available for personnel, including dormitories, a kitchen, pilot and NCOs' mess, and administrative offices. Hangars were not constructed, except in Santa Cruz, Villamontes and Tarija in Bolivia, and Concepción and Asunción in Paraguay, and aircraft were normally kept under tall trees whose lower branches were cut. Some of the main bases also had a hospital with medical personnel.

The Bolivians organised a series of logistics air routes from La Paz, the capital, with stops in Cochabamba, Sucre or Oruro, then Villamontes or Santa Cruz, and finally Ballivián and Muñoz. For Paraguay, the air routes departed from Asunción, the capital, to Concepción. From there, to Puerto Casado, Isla Taguató or Isla Poí. From Puerto Casado, the Naval Aviation flew northwards to Bahía Negra. Because of the victorious offensive campaign of the Paraguayan Army, more air bases were either conquered, such as Camacho or Picuiba, or just established, such as Cabezón, Yrendagué and Ybamirante.

CHAPTER 2

THE CONFLICT BACKGROUND

It was in 1852 when Paraguay and Argentina signed a treaty that stipulated the Paraguay River belonged to Paraguay *"from coast to coast and all its length"*. Bolivia did not accept that treaty and submitted a complaint. Then, after the Triple Alliance War (1864–70 when Paraguay simultaneously took on Argentina, Brazil and Uruguay in an unequal and unwinnable conflict), Paraguay lost the Central Chaco region, which was taken by one of the victors, Argentina. As for the North Chaco, the zone between the Pilcomayo and the Verde rivers was subjected to international arbitration, which was done by US President Rutherford B. Hayes, who finally ceded that area to Paraguay as its legitimate owner. Bolivia never accepted that verdict.

Although there was never a definitive border treaty between Paraguay and Bolivia, the former had always defended its legal right to possess the whole North Chaco region because of many maps and documents from the Spanish Colonisation times. The Paraguayans had claimed the whole North Chaco region, from the Otuquis and Parapiti rivers in the northwest to the Pilcomayo and Paraguay rivers in the southeast, as part of its territory. Between 1879 and 1907, a series of treaties was signed between both countries to regularise the border issue, but none of them were appropriately ratified by both nations' congresses. Meanwhile, since the beginning of the 20th century, Bolivia had slowly initiated the occupancy of the Chaco region, establishing military forts and settlements, and building air strips in Saavedra, Platanillos, Madrejón, Ingavi, Cañada Oruro, Capiirendá, Carandayty, Macharetí, Charagua, Camacho, Muñoz, Ballivián and Villamontes. Paraguay did the same on a smaller scale but the first air strips were built just in the first months of the war in Isla Taguató, Isla Poí, Port Casado and Nanawa.

A Bolivian *Fokker CVB* used in the retaliation raid on Bahía Negra in 1928. (*Ramiro Molina Alanes*)

At the end of the civil war of 1922 in Paraguay, the authorities understood that the border issue with Bolivia would not have a diplomatic outcome and so the governments of Eligio Ayala (1924–28) and José P. Guggiari (1928–32) began secret military preparations for a future war. The Paraguayan Army was completely reorganised and some foreign military missions were hired to professionalise the armed forces. All sorts of modern weapons were purchased for the army, navy and air force in Europe. The Paraguayan government was fully aware of the Bolivian penetration in the Chaco, but in the 1920s Paraguay was not yet prepared to face a total war against its neighbour.

In December 1928, however, the first skirmishes between Paraguayan and Bolivian troops took place in the Chaco. By that time, Bolivia had occupied half the region and consequently, Paraguayan troops invaded the Bolivian fort of Vanguardia in the north. That led to the rupture of diplomatic relations. It was then that the first air raid took place in the Chaco. In retaliation, the Bolivian government planned a bombing mission on three Paraguayan forts: Bahía Negra, Patria and Galpón. On 15 December, *Breguet XIX "Potosi"*, crewed by two members of the French military mission in Bolivia, Major Henri Lamaitre as the pilot and Sergeant Ernest Foucher as the mechanic and gunner, and a *Fokker CVB*, crewed by Sub-Lieutenant Faustino Rico Toro as the pilot and Major Alfredo Santalla as the observer, took off

The Bolivian *Breguet XIX "Potosi"*. (*Ramiro Molina Alanes*)

for such mission. The *Breguet* had technical problems and aborted the mission, but the Fokker reached the targets and dropped some bombs, which did not explode since the fuses were not armed. Sabotage was suspected but the Bolivians proved that they could attack any target in the Chaco. That air raid was followed by the attack on the Paraguayan forts of Boquerón and Mariscal López. Following those actions, the Paraguayan government carried out a general mobilisation of troops but international mediation postponed the conflict for four years.

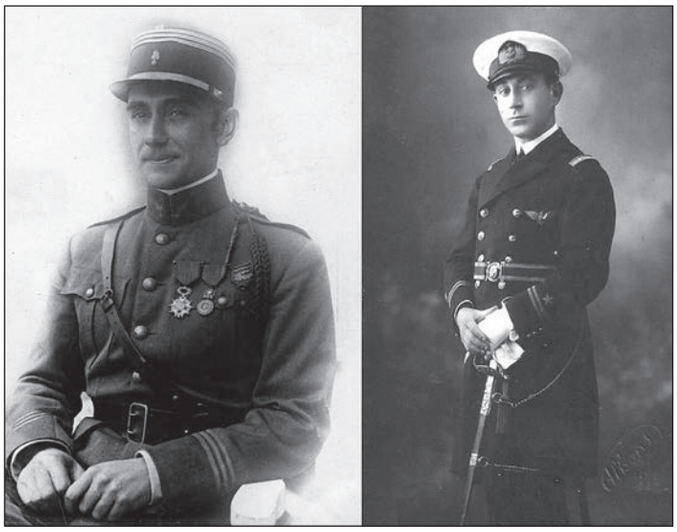
The famous Vickers contract signed by Bolivia with the UK included aircraft, artillery ordnance, rifles, carbines, machine guns, tanks and ammunition, for 2,190,000 pounds. Both nations continued buying weapons, Bolivia mainly from England and Germany, and also signed a contract with *Curtiss-Wright* in the US for trainers, fighter-bombers and fighters for its military aviation, and Paraguay from France and Italy. Paraguay spent 4,730,733 dollars between 1923 and 1932 to buy aircraft, rifles, machine guns, ammunition, artillery ordnance for the army and air force, and two river gunboats for the navy.

By mid-1932, war was inevitable. Two very different military conceptions would face each other: the German General Hans Kundt, a First World War veteran, hired by the Bolivian government, with typical Prussian tactics of front attacks regardless of the loss of lives, to take and possess as much territory as possible without annihilating the enemy, and the then Lieutenant Colonel José Félix Estigarribia (later promoted to Colonel and then General during the war), who also had combat experience in the Revolution of 1922, and took some specialisation courses in Chile and France, who would use trenches and flank attacks to destroy the enemy, which happened to be the most effective tactics. One advantage that the Paraguayan armed forces had was the takeover of a huge quantity of Bolivian weapons and ammunition during the victorious battles throughout the war.

CHAPTER 3

PARAGUAYAN MILITARY AVIATION

Paraguayan Air Arm badge.



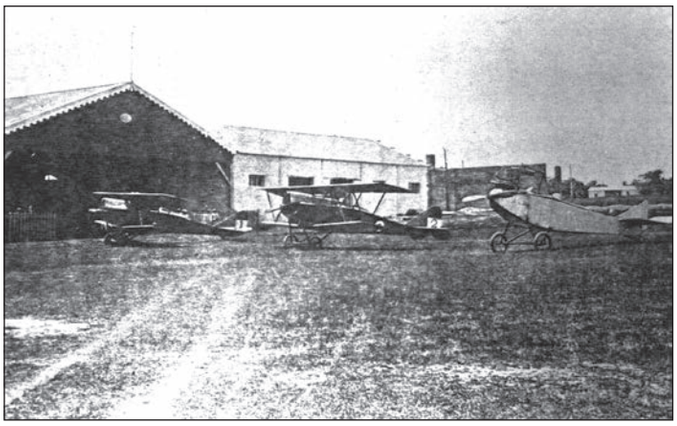
Major HC Vicente Almandos Almonacid (left) was the Military Aviation School director in 1932, later replaced by Lieutenant Commander PAN José Bozzano (right). (*Instituto de Historia y Museo Militar del Ministerio de Defensa Nacional*)

It was called *"Aviación en Campaña"* (Aviation in Campaign) or *"Arma Aérea Paraguaya"* (Paraguayan Air Arm). During a short period of six years, from 1927 to 1933, the Paraguayan government acquired a total of 58 aircraft: 16 fighters, 14 bombers, 12 transport and liaison planes, 12 trainers, and 4 flying boats for the Naval Aviation.

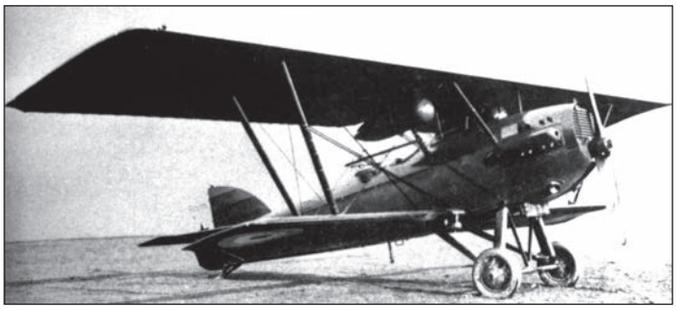
Combat planes

At the end of the Revolution of 1922, two surviving biplanes, an *Ansaldo SVA-5* and a *SVA-10*, were the first combat planes for the new Military Aviation School. They were both used as trainers extensively until new aircraft were bought in the late 1920s. Both *Ansaldo* biplanes had already been withdrawn from service when the war broke out.

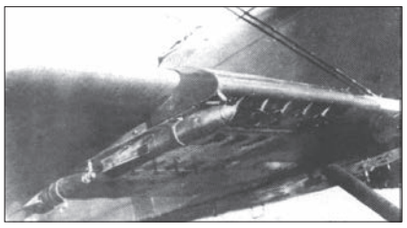
The *Potez 25* bombers were the only type of aircraft that was used throughout the war. A total of 14 of these sturdy bombers were bought; the first six, which were *Potez 25A.2*, arrived in 1928, and the following eight, the TOE version, in the second semester of 1932. All the Paraguayan *Potez* bombers were powered by a 450hp water-cooled *Lorraine-Dietrich 12Eb* engine and were painted in overall dark olive green; later, the engine cowling was left in bare metal. They could carry four 7.65mm *Madsen* machine guns: one fixed for the pilot, a pair mounted on a scarff ring for the gunner and a semi-fixed mounted on the gunner's floor, rarely used in Paraguayan service, and two bomb racks under the lower wings that could carry a total of 200 kilos of bombs. The A.2s received the serials 1 to 6 and were incorporated into the *First Reconnaissance and Bombing Squadron* (*"Primera Escuadrilla de Reconocimiento y Bombardeo"*), and the TOEs from 7 to 14 (later in the war, the TOE Nr.8 was reserialled as 15) that belonged to the *Second Reconnaissance and Bombing Squadron* (*"Segunda Escuadrilla de Reconocimiento y Bombardeo"*). The TOE bombers (*Théâtres d'Opérations Extérieures,* in French) were affectionately called *"Panzones"* (big bellies) for their thicker fuselage.



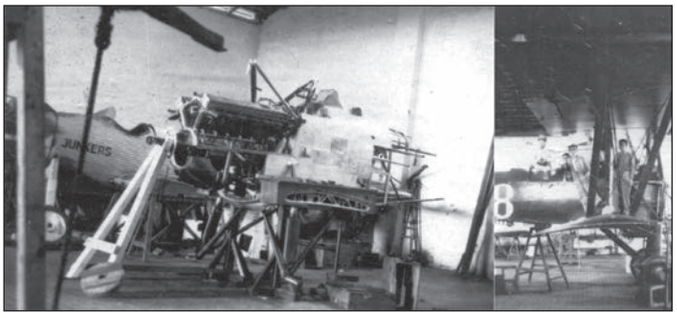
From left to right: The *Ansaldo SVA-10* serial 1, the *Ansaldo SVA-5* serial 2 and a wingless *SAML A.3* used to practise taxiing at the Military Aviation School in 1923. (*Carlos Alberto Pusineri Scala*)



A Paraguayan Air Arm *Potez 25A.2* fitted with the reserve fuel tanks. (*Musée de l'Air*)



Potez 25 bomb rack. (*Musée de l'Air*)



The Paraguayan Air Arm maintenance unit at Ñu-Guazú AFB in 1933. A *Fiat C.R.20bis* is being repaired next to a *Junkers A.50 Junior* (left) and a *Potez 25* bomber (right). (*Tito Aranda*)

it was carried out professionally by the maintenance chief, Second Lieutenant MAM Agustin Pasmor.

A single *Curtiss D.12 Falcon*, which received the serial number 17, was in service in the Paraguayan Air Arm. It was painted in overall silver dope and was powered by a 425hp water-cooled *Curtiss D-12E Conqueror* engine. The Falcon was captured in very peculiar circumstances; it belonged to a number of aircraft built under licence in Chile for the São Paulo revolutionaries in Brazil. One of them flew over Paraguayan territory on 24 August 1932 and was mistakenly assumed to be a Bolivian bomber. Two *Wibault 73* fighters took off from Ñu-Guazú AFB to intercept the intruder and forced the Falcon to land. It was then that the Falcon pilot, an Argentine, explained that he was taking the plane to Brazil. The Falcon was seized and incorporated into the Paraguayan Air Arm. Although unarmed except for a couple of Madsen machine

Second Lieutenant MAM Agustin Pasmor (left), maintenance chief of the Paraguayan Air Arm, with a colleague posing with a *Travel Air S6000B* at Isla Poi AFB in 1933. (*Colonel Pasmor*)

The Paraguayan Air Arm *Potez 25s* were deployed to all fronts during the war. Out of the 14 bombers acquired, one was lost in a non-fatal accident before the war (serial 2), two were shot down in different dogfights (serials 6 and 13), five were lost in accidents and incidents and cannibalised to keep the rest of the fleet in service (serials 1, 3, 4, 10 and 14), and six survived the war and were kept in service until the early 1940s (serials 5, 7, 9, 11, 12 and 15 ex-8). The field maintenance proved to be a nightmare because of the rough conditions of the terrain and the extreme temperatures, but

Paraguayan Air Arm *Potez 25TOE* serial 11 at Ñu-Guazú AFB. (*Tito Aranda*)

Curtiss D.12 Falcon Nº 17 of the Paraguayan Air Arm at Isla Poi AFB in 1933. (*Instituto de Historia y Museo Militar del MDN*)

The canopy fitted for presidential use in the *Curtiss D.12 Falcon*. The President of Paraguay, Dr Eusebio Ayala, was being received by high-ranking officers in one of his visits to the battlefront. (*Victor Meden*)

guns in the rear cockpit for the gunner, it was widely used in the war in reconnaissance missions and also as a VIP transport for the President, Dr Eusebio Ayala in his visits to the battlefront. For this purpose, a special canopy was mounted in the gunner's cockpit for the President. The Falcon survived the war and was kept in active service until the early 1940s.

Regarding the Paraguayan fighters, the first true one was a single sample of the *Savoia S.52,* which happened to be the factory demonstrator. It was powered by a 300hp water-cooled *Hispano-Suiza H.S.42* engine. It was bought in 1927 and later received the serial number 16. It was armed with two fixed 7.7mm machine guns. It was originally painted in silver and black but later received an overall dark olive green colour scheme. The *S.52* never saw combat in the Chaco and was extensively used to train fighter pilots at Ñu-Guazú AFB. It was severely damaged in a non-fatal accident on 8 May 1933 while being crewed by First Lieutenant PAM Emilio Rocholl.

Seven *Wibault 73C.1* fighters were acquired new directly from the factory in France in 1929. They received the serial numbers 1 to 7 and were painted in overall dark olive green. They had two fixed 7.65mm *Madsen* machine guns and were also powered by 450hp water-cooled *Lorraine-Dietrich 12Eb* engines. Serial 4 was lost in a fatal accident in 1931 that killed its pilot, Second Lieutenant PAM Ernesto Quiroz. Together with the *Potez 25A.2* bombers, they were the first combat aircraft to be deployed to the theatre of war. They actively participated in the first big battle of the conflict, in Boquerón, between 9 and 29 September 1932. During that battle, the Wibault escorted the *Potez 25s* in their bombing and reconnaissance missions, but unfortunately the fighters had technical problems with their engine radiators. Serials 1 and 2 were lost in accidents at that time because of faulty radiators. The rest of the fleet was kept in operations through the battles of Saavedra, Muñoz, Toledo, Arce, Corrales, Yucra and Cabo Castillo, to be relieved in 1933 by the *Fiat C.R.20bis* fighters. Miraculously, the Wibault did not participate in any dogfights against the Bolivian fighters. They belonged to the First Fighter Squadron (*"Primera Escuadrilla de Caza"*) of the Paraguayan Air Arm. Once relieved by the Fiats, the Wibault fighters were sent to Asunción, the capital, for local defence, and eventually their engines were used as spares for the *Potez* bombers. During the war, some Wibault fighters received temporary serials to make Bolivians believe that Paraguay had more fighters; for instance, Wibault 3 was 23 as seen in the picture below.

The above-mentioned technical problems with the Wibault fighters meant the Paraguayan government bought five *Fiat C.R.20bis*, which arrived in Paraguay at the beginning of 1933. A new fighter unit was formed, the Eleventh Fighter Squadron (*"Undécima Escuadrilla de Caza "Los Indios"*), which was known as "*The Indians"*, and they received the serial numbers 11.1, 11.3,

The sole *Savoia S.52* fighter at Ñu-Guazú AFB before the war. (*Instituto de Historia y Museo Militar del MDN*)

First Fighter Squadron *Wibault 73 C.1* at Isla Poi AFB in the Chaco in September 1932. (*Instituto de Historia y Museo Militar del MDN*)

Captain PAM Leandro Aponte posing with the newly acquired *Fiat C.R.20bis* of the Eleventh Fighter Squadron at Isla Poi AFB in May 1933. (*Instituto de Historia y Museo Militar del MDN*)

11.5, 11.7 and 11.9. They were fitted with two fixed 7.7mm *Vickers Type E* machine guns and used a special kind of fuel known as *"trinary mixture"*, which consisted of 65 percent of 73-octane gasoline, 25 percent of alcohol and 10 percent of benzol for their 410hp water-cooled *Fiat A-20* engines. They were painted in overall silver dope and since all the Bolivian fighters used the same colour scheme, the Fiats did not use the Paraguayan roundels but red-white-blue stripes in their wings, to avoid confusion. They were used in many escort missions to the *Potez 25* bombers and they also participated in several dogfights against Bolivian fighters. Although they were slower than the Bolivian Curtiss fighters, the Fiats were more manoeuverable.

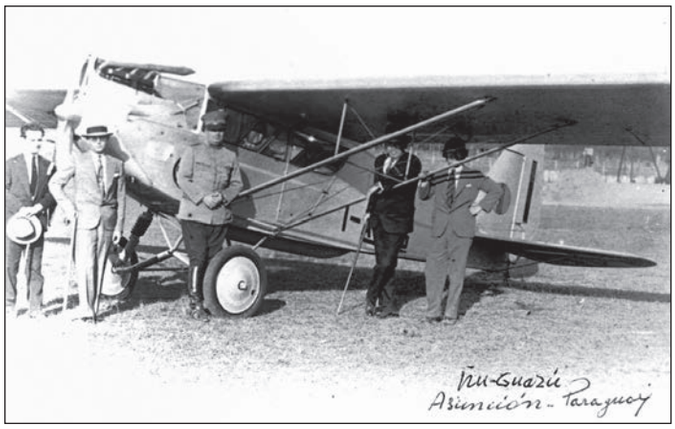
The most famous Paraguayan fighter pilots were Major PAM José Atilio Migone, captains PAM Leandro Aponte, José Gregorio Morínigo, Bernardino Caballero Álvarez, Román Garcia, Walter Gwynn, Vladimir Porfenenko (a White Russian volunteer and a First World War veteran), Tomás Ruffinelli and Luis Escario, and first lieutenants PAM Osvaldo Salerno Netto, Abelardo Bertoni and Adbón Álvarez Albert.

Transport planes

The *Transport Squadron* (*"Escuadrilla de Transporte"*) of the Paraguayan Air Arm had a total of nine different types of aircraft. A single *Breda Ba.15S* was bought from a First World War Italian veteran pilot, Sergeant Nicola Bo in 1929. It had the Italian registration I-AAUG but eventually received the serial number T-8 during the war. It was painted in overall silver dope and powered by a 115hp air-cooled *Colombo S.63* engine and could accommodate the pilot and one passenger. It was used as a liaison plane until it was destroyed in a non-fatal accident in 1933.

In 1932, some second-hand planes were purchased in the Argentinean civil market, including two *Junkers A.50fe Junior*, which were used as liaison planes, with the serials T-3 and T-5, kept in overall bare metal and powered by an 88hp air-cooled *Armstrong-Siddeley Genet AS4* engine.

A couple of second-hand *Travel Air S6000B* was purchased in the US at the end of 1932 by the National Board of Supplies. They were brought to Paraguay by ship via Buenos Aires and then Asunción. They were both painted in overall black, although one was soon painted with silver dope. They had a 300hp air-cooled



The Paraguayan *Breda Ba.15S*. (*Roberto Gentilli*)

Captain PAM Leandro Aponte at the controls of one of the *Junkers A.50fe Junior* at Ñu-Guazú AFB in 1932. (*Instituto de Historia y Museo Militar del MDN*)

Wright Whirlwind R-975-E.1 engine and could accommodate a pilot and five passengers. Once in service, they received the serials T-2 and T-5 (later T-9) in the *Transport Squadron* and were used mainly as air ambulances during the war. Their intensive use in medevac missions did not allow President Ayala to use them as VIP transport. They were also used to transport medical supplies, food, ammunition, etc. One memorable pilot of these planes was First Lieutenant PAM Emilio Nudelman, who became one of the

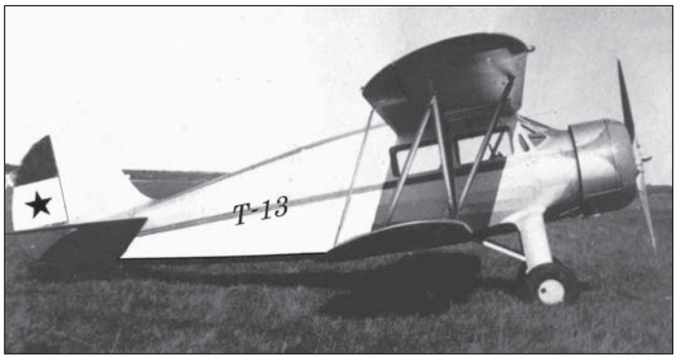
Several pilots and aircraft mechanics with one of the *De Havilland DH60 Gipsy Moths* at Ñu-Guazú AFB in 1932. (*Dr Hermes Gómez Ginard*)

first commercial pilots in the Uruguayan pioneer airline *PLUNA* in 1936, right after the war. They were both kept in pristine conditions throughout the conflict and both survived to be kept in service until 1944 when they were transferred to the first Paraguayan airline, *Líneas Aéreas de Transporte Nacional* (*LATN*), which was run by the military aviation.

Two *De Havilland DH60 Gipsy Moth*, serials T-1 and T-4, were also bought in Argentina for liaison missions and as trainers. They were painted in overall silver dope and were powered by a 100hp air-cooled *Gypsy 1* engine. *Gipsy Moth* serial T-4 survived the conflict and it was then transferred to the Paraguayan Aero Club in 1936 to train civil pilots; T-1 was destroyed in an accident at Ñu-Guazú AFB on 30 September 1932, killing second lieutenants PAM Alejandro Islas and Silvio Escobar.

A *Waco C* cabin biplane was acquired in Argentina in January 1933, which received the serial T-13. It was painted in overall silver dope with a red cheatline along the fuselage, and was powered by a 210hp *Continental R-670* engine. It could accommodate the pilot and three passengers. The Waco was a donation of all the employees of the International Products Corporation (IPC) company from Port Pinasco in the Chaco. IPC was one of the tannin industries

Travel Air S6000B serial T-9 of the *Transport Squadron* at Isla Poi AFB in 1933. (*Instituto de Historia y Museo Militar del MDN*)



The Transport Squadron *Waco C* serial T-13 at Ñu-Guazú AFB in January 1933. (*Instituto de Historia y Museo Militar del MDN*)

Breda Ba.44 serial T-15 at Isla Poí AFB in 1934. (*Dr Hermes Gomez Ginard*)

Paraguayan Air Arm's *Consolidated Model 21* (*PT-11*) being readied for a flight at Isla Poi AFB in 1934. (*Instituto de Historia y Museo Militar del MDN*)

mentioned earlier. The *Waco* saw very little use in the war as a transport plane since it was severely damaged in an accident after just two months of service.

A *Curtiss Robin C* was also bought in Argentina in October 1933. It had a 185hp air-cooled *Curtiss Challenger R-600* engine and it later received an overall dark olive green colour scheme. It received the serial T-7 and it was used as a VIP transport and air ambulance and could accommodate a pilot and three passengers.

In March 1933, a *Breda Ba.44* transport biplane was bought directly from the factory in Italy. It originally received the serial T-1 but was later changed to T-15. It was baptised with the name of *"Asunción"* and was powered by two 190hp air-cooled *Walter Major-Six* engines. It was painted in overall silver dope except the fuselage bottom, which was black. It could accommodate two crew members and six passengers. It was also used as an air ambulance

SAML A.3 serial MET-1 used as a basic trainer not only at the *Military Aviation School* but also at the *Naval Aviation School*. (*Instituto de Historia y Museo Militar del MDN*)

and survived the war, being transferred to LATN in 1944.

Some of the transport pilots were captains PAM Emilio Nudelman, José D. Jara and Luis Escario, First Lieutenant HC Nicola Bo, and second lieutenants PAM Abdón Caballero Álvarez and Alberto Acuña Falcón.

Other transport planes purchased included a *Consolidated Model 21-C* (*PT-11*), which happened to be the factory demonstrator on a tour in South America. It visited Paraguay in 1933 and the government decided to incorporate it into the *Transport Squadron*. It received the serial T-11, and it was used in liaison and high-speed courier missions, and sometimes as presidential VIP transport. It was painted in overall silver dope and had a 200hp air-cooled *Lycoming R-680A* engine. It survived the war.

A *CANT 26* was acquired from Nicola Bo in 1932. It received the serial T-6. Painted in overall silver dope, it had an 80hp air-cooled *ADC Cirrus III* engine. On 5 May 1933, this plane was lost in a fatal accident when flying from the city of Concepción to Orihuela (Chaco), killing both crew members, Captain PAM José D. Jara and Second Lieutenant MAM Niemann.

Trainers

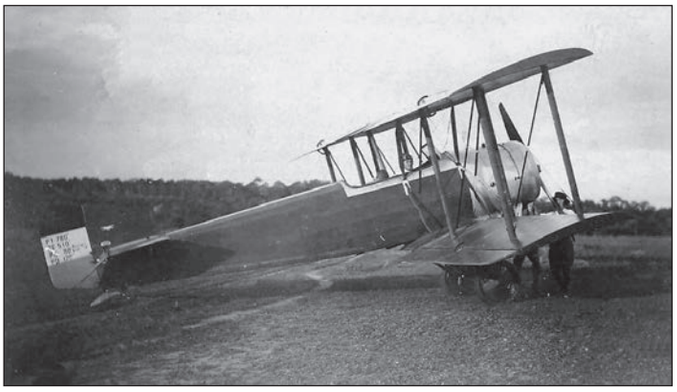
All trainers belonged to the *Military Aviation School* (*"Escuela de Aviación Militar"*) but during the war, the *Training Squadron* (*"Escuadrilla de Entrenamiento"*) was formed. Two *SAML A.3* survived the Revolution of 1922 and were later used in the *Military Aviation School* as trainers, painted in overall silver dope. They received the serials MET-1 and MET-2 (*Training and Transport Machine*, the initials in Spanish) and were powered by a 130hp water-cooled *Colombo* engine. The wings were removed in one of them so pilot cadets could be trained in taxiing. The other one was also used to train the Paraguayan Naval Aviation cadets. One survived the war and was later ceded to the Paraguayan Aero Club (*"Aeroclub del Paraguay"*) to train civil pilots in 1936.

Once the French military mission took charge of the *Military Aviation School* in 1926, its members recommended the acquisition of new aircraft, trainers and combat planes, which, of course, were of French origin. The list included three *Hanriot HD.32* basic trainers that received the serials E-1, E-2 and E-3, which arrived in 1929, with 80hp rotative air-cooled *Le Rhöne* (*Gnome et Rhöne*) engines, and painted in overall dark olive green, except the engine cowling that was kept in bare metal; one *Morane-Saulnier M.S.35*

Morane-Saulnier M.S.35 serial E-4. (*Instituto de Historia y Museo Militar del MDN*)

Members of the French military mission in Paraguay in 1926. The first officer on the right was Captain Fromont, who was in charge of the *Military Aviation School*. (*Dr Hermes Gomez Ginard*)

Morane-Saulnier M.S.139 serial E-5 of the *Training Squadron* at Ñu-Guazú AFB. (*Instituto de Historia y Museo Militar del MDN*)



A *Hanriot HD.32* of the *Military Aviation School* at Ñu-Guazú AFB in 1927. (*Instituto de Historia y Museo Militar del MDN*)

ep2 and one *M.S.139 ep2*, which were E-4 and E-5 respectively and both with 130hp rotary air-cooled *Clerget 9B* engines. The Moranes were the second step for the pilot cadets in their flight training and they were also painted in overall dark olive green except the front half of the fuselage, which was in bare metal. The Moranes survived the war and were transferred to the Paraguayan Aero Club in 1936.

In 1931, five second-hand *Consolidated Fleet-2s* were bought in the Argentinean civil market to be used as basic trainers. They received the serials E-7, E-9, E-11, E-13 and E-15 and were painted in overall silver dope. Four of them had 125hp radial air-cooled *Kinner B-5* engines and one a 160hp of the same kind of engine. Even though their main role was to train cadets, some Fleets were also used as liaison planes during the war. E-11 was destroyed in a fatal accident in 1935 in Concepción and the other four survived the war. At the beginning of the 1940s, they were sent to Argentina for a complete overhaul and after that they were kept in service until the mid-1940s when they were transferred to LATN as mail planes. In 1953, one of them was sold to the *"Mbyyu'i"* (*"swallow"*, in Guarani language) gliding club to tow gliders. In the 1970s, following a minor accident, it was dismantled and kept in storage for two decades. In 1990, it was donated to the Paraguayan Air Force and restored to flying conditions by the *"Yvytú"* (*"windy zone"*, in Guarani) Aero Club, where it is at present, being the only surviving plane of the Chaco War.

First Lieutenant PAM José Gregorio Morínigo and Second Lieutenant Tomás Ruffinelli (in white uniforms) together with some mechanics posing with a *Consolidated Fleet* at Ñu-Guazú AFB in 1932. (*Tito Aranda*)

Potez 50 A.2. (*Musée de l'Air*)

Dewoitine D.21 **built in Argentina under licence.** (*Fuerza Aérea Argentina*)

Failed acquisitions

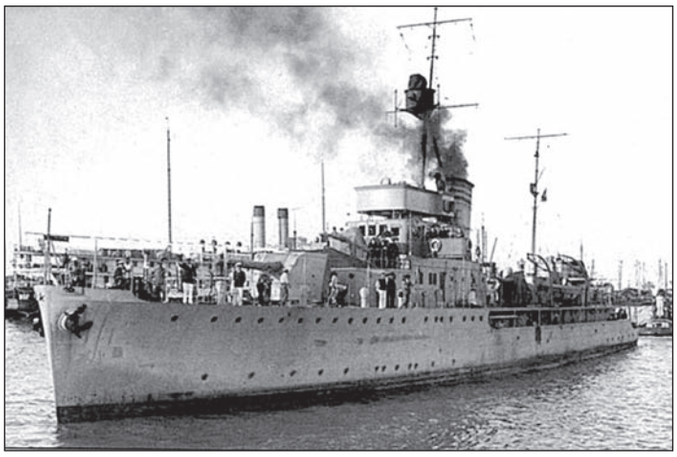
Paraguay tried to buy more combat planes to reinforce its fleet. Since it was declared the *"aggressor"* country by the League of Nations, all military sales to Paraguay were vetoed from 1934 on. This is why the Paraguayan Air Arm could not receive 9 *Potez 50A.2* (the *Potez 25* improved version) from France, 9 *Curtiss Osprey* (similar to the ones used in Bolivia), 5 *Fokker CVE* (already paid but seized by the Dutch government), 10 *Bristol F.2B* and 15 *Dewoitine D.21* from Argentina. Regarding the *Ospreys* offered to Paraguay, the Curtiss officials had already found the way to export the fighters to Paraguay in spite of the embargo, but there was a disagreement about the price.

CHAPTER 4

THE PARAGUAYAN NAVY AND NAVAL AVIATION

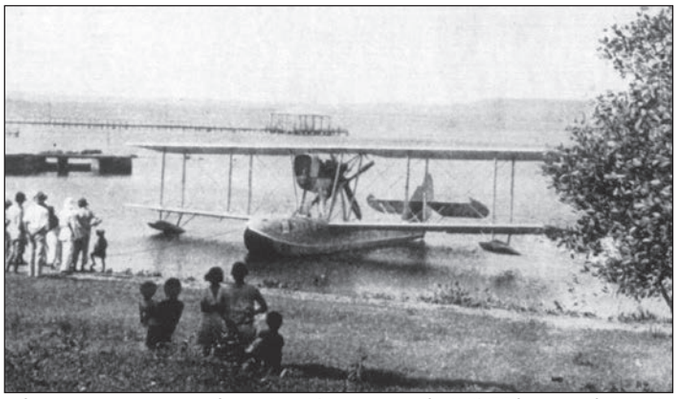
The Paraguayan Navy (*"Armada Nacional"*) deserves a special chapter. It did not have a Bolivian counterpart, so the dominance of the Paraguay River was absolute. At the beginning of the war, there were three gunboats in service: the twins *"Paraguay"* and *"Humaitá"*, built in Italy, which were heavily armed and delivered in 1931, and the *"Tacuary"*, which had been in service since the beginning of the 20th century. There were also four armed patrol boats: *"Capitán Cabral"*, *"Capitán Figari"*, *"Cnel. Martinez" and "Tte. Herreros"*. During the war, the Paraguayan Navy also used several private ships and boats from Argentinean and Paraguayan shipping companies for logistics, including five cargo ships, one passenger transport ship that was converted to a floating hospital, eighteen tug boats, eight 100-ton barges, twelve 50-ton boats for general purposes and eleven motorboats. Most of these ships, including the gunboats, were used to transport troops, prisoners of war, wounded and sick soldiers, livestock, artillery ordnance, ammunition, all sorts of guns, aircraft to be repaired, etc. Only a few times did the Bolivian aviation attack the gunboats, but they could not damage them due to their anti-aircraft guns. The navy arsenal also contributed to the war effort by building mortars, truck chassis, hand grenades, aviation bombs and ammunition.

The *Naval Aviation School* (*"Escuela Aeronaval"*) was created on 17 August 1929 with the purchase of a *Savoia Marchetti S.59bis*, which received the serial R-1 (R for Reconnaissance) and named

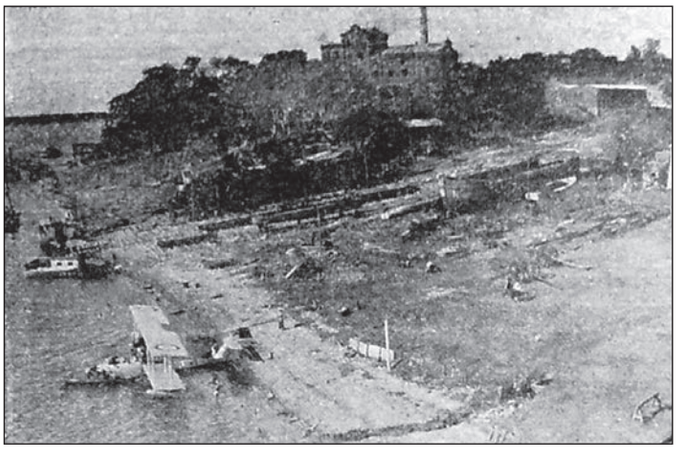


The twin gunboats *"Paraguay"* (photo) and *"Humaitá"* of the Paraguayan Navy assured the country's supremacy in the Paraguay River during the war. (*Archivo de la Armada Nacional*)

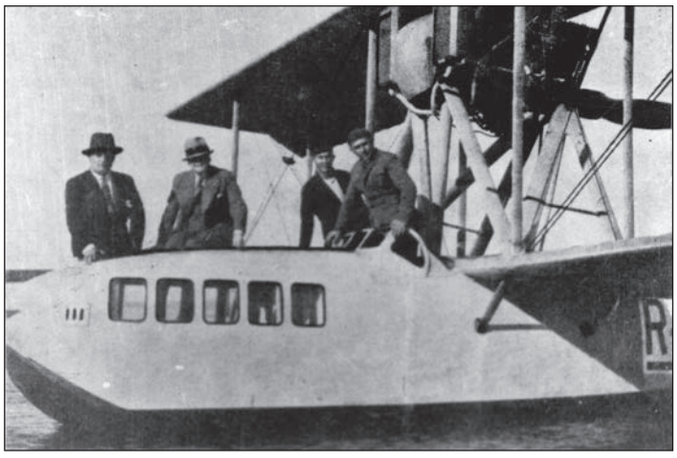
Two outstanding naval aviators, First Lieutenants PAN Martino and Diaz Benza. (*Archivo de la Armada Nacional*)



The Paraguayan Naval Aviation *Savoia Marchetti S.59 bis*, serial R-1, at Ypacaraí Lake in 1931. (*Instituto de Historia y Museo Militar del MDN*)



Paraguayan Naval Aviation station in Asunción in the early 1930s. (*Archivo de la Armada Nacional*)



The *CANT 10ter*, still with the Argentinean registration painted on the fuselage, later serial H-1 in the Paraguayan Naval Aviation, at Sajonia NAS in 1929. (*Archivo de la Armada Nacional*)

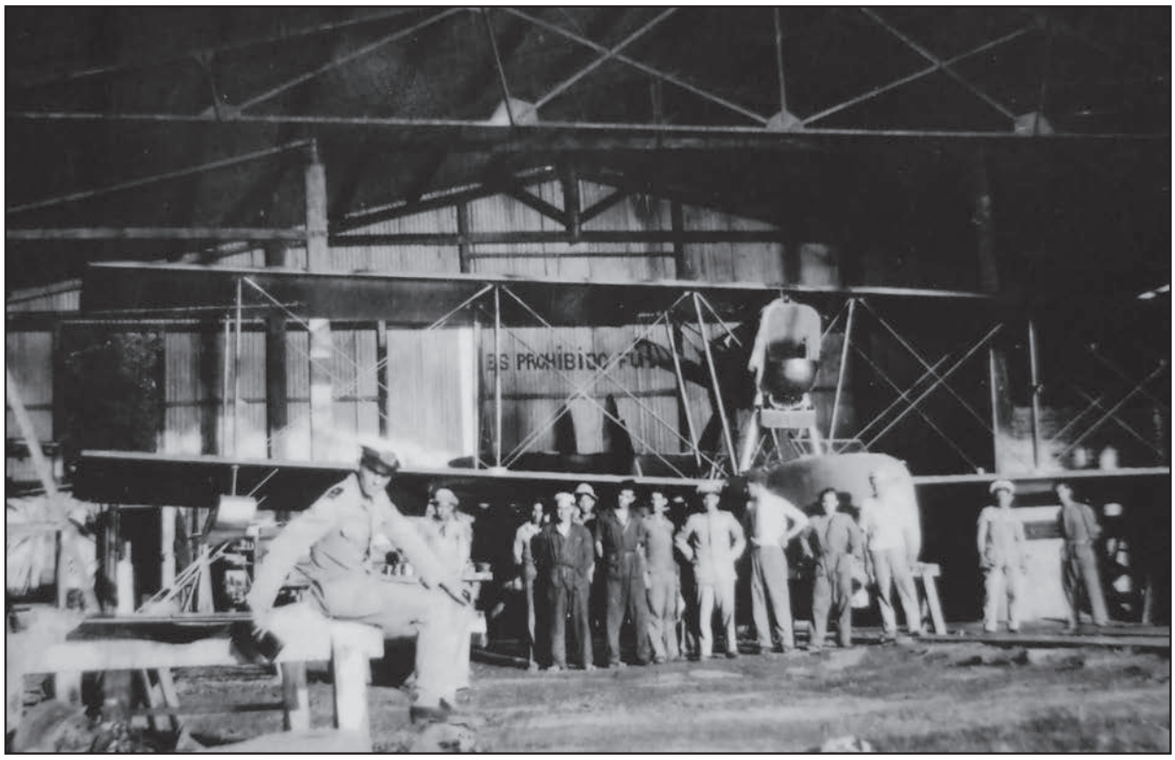
"Chaco". It was painted in overall silver dope with black in the bottom hull and had a 500hp *Asso Isotta-Fraschini* engine. It was mainly used as a transport flying boat but also in reconnaissance missions. It survived the conflict and was in service until 1940. Together with the *S.59*, the navy also acquired a *CANT 10ter,* serial H-1 (H for Hydroplane), for transport. It was also painted in overall silver dope with black underneath and had a 400hp water-cooled *Isotta-Fraschini* engine. It could accommodate four passengers in its cabin. Its intense use during the war saw it withdrawn from service at the end of 1933.

The Naval Aviation (*"Aviación Naval"*) also received two armed *Macchi M-18A.R.* ("*ali ripiegabili*", in Italian meaning folding wings) flying boats, which received the serials R-3 and R-5 in 1933. They were painted in overall silver dope and black underneath and had a 250hp water-cooled *Asso Issotta Fraschini V6B* engine. They were intensively used to patrol the Paraguay River and also in reconnaissance and bombing missions in the north front. For defence, they had twin Madsen machine guns, and two bomb racks that could carry 120 kilos of bombs. They were used for the first nocturnal bombing missions on the Bolivian forts in the north front in 1934 and 1935. R-3 was destroyed in a non-fatal accident at the end of the war; R-5 survived it and was kept in active service until 1942. Some navy pilots were also assigned to fly *Potez 25* bombers in the Paraguayan military Air Arm.

Lieutenant Colonel HC Ernesto Colombo, an Italian First World War veteran, was appointed as director of the *Naval Aviation School*. The first instructors were also Italian, Antonio Costagliola and Césare Sandroni, both pilots, and Vincenzo Gerasi, mechanic. First Lieutenant HC Nicola Bo, another Italian First World War veteran pilot, was hired for basic flight instruction, using one *SAML A.3* in the *Military Aviation School* at Ñu-Guazú AFB.

The promotion of Naval Aviation pilots included the following officers: navy first lieutenants PAN Porfirio Machuca and Ramón Díaz Benza, and navy second lieutenants PAN Ramón Martino, Víctor Urbierta Rojas, Heriberto Osnaghi and Teófilo Fariña

One of the *Macchi M-18A.R.* at Sajonia NAS in 1932. (*Archivo de la Armada Nacional*)



Paraguayan Naval Aviation main hangar at Sajonia NAS in Asunción. Note the *Savoia Marchetti S.59bis* in the back with the technical personnel, and First Lieutenant PAN Ramón Martino on the left. (*Archivo de la Armada Nacional*)

Sánchez. They all received their pilot wings in January 1930. The first promotions of the Naval Aviation technicians included NCOs Juan Schaerer, Juan Keim, Carlos Olmedo, Alberto Palacios, Reinaldo Pagani, Otto Rocholl, José Morales, Hernán Martinez, Anibal Zavala Spika, Manuel Amarilla, Hernán Zotti and Adolfo Dalhquist.

The first Paraguayan Naval Aviation commander was navy First Lieutenant PAN Ramón Diaz Benza, from 1929 to 1931, being substituted by Second Lieutenant PAN Ramón Martino.

The Naval Aviation headquarters was at Sajonia naval air station in Asunción, together with its main maintenance unit and hangars. Other naval air stations were in Port Casado and Bahía Negra, both on the west bank of the Paraguay River.

CHAPTER 5

BOLIVIAN MILITARY AVIATION

Colonel Bernardino Bilbao Rioja (left), director of the *Military Aviation School* and aviation general inspector, and Major Jorge Jordan (right), battlefield commander of the Air Forces. (*Alas de Bolivia* by Amalia Villa de la Tapia)

A *Curtiss-Wright BT-32* bomber. (*Instituto de Historia y Museo Militar del MDN*)

Bolivian military pilots with *Vickers Scout* fighters in 1932. (*Ramiro Molina Alanes*)

Between 1925 and 1934, Bolivia bought a total of 104 aircraft for its military aviation: 15 fighters, 20 fighter-bombers, 36 bombers, 18 trainers and 15 transports. The only planes that could not be delivered because of the embargo of the League of Nations were four *Curtiss-Wright BT-32 Condor* heavy bombers, which were already purchased, but in the delivery flight they were seized by the Peruvian authorities in Lima during a technical stop. It is also believed that the last two or three *Curtiss Hawk II* fighters were not delivered, being seized by customs authorities.

The Bolivian aerial presence in the Chaco dates back many years before the conflict with Paraguay. Many exploratory flights were performed by the Bolivian Military Aviation in the late 1920s and early 1930s without being bothered by the Paraguayan aviation. The first air strips were built in the Chaco by the Bolivians, in their slow penetration of the region. Because of those exploratory flights, the Bolivian government had very precise data about not only the few Paraguayan forts in the Chaco but also the vital locations of lagoons, creeks and rivers in the zone. On 3 July 1931, a *Lloyd Aéreo Boliviano* (LAB, the Bolivian first airline founded in 1925) *Junkers W.34*, crewed by the German pilot Hermann Schroth with three observers, took off from Roboré in a seven-hour exploratory flight over the Chaco. Other flights took off from Charagua and Villamontes, which gathered precious information for the Bolivian Army before the war.

Bolivia had the best conditions to conquer the whole Chaco region. Its military aviation was very powerful and the *LAB* supported the military effort by ceding all its aircraft fleet and crews to the war effort. From 1932 and 1935, the *LAB* made a total of 9,706 flights to the war zone, in 14,895 flight hours, covering some 2,851,446 kilometers, carrying 58,259 passengers and 9,255,561 kilos of precious cargo.

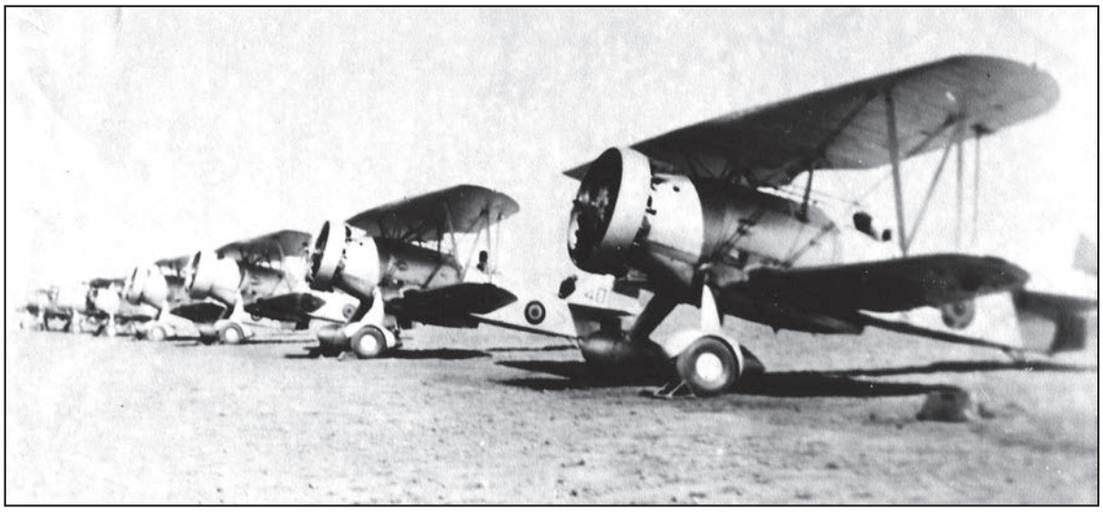
The top authority of the *Bolivian Military Aviation*, also known as *Air Forces* (*"Fuerzas Aéreas"*), was Colonel Bernardino Bilbao Rioja, who was the director of the *Military School of Aviation* (*"Escuela Militar de Aviación"*) and also the Aviation General Inspector (*"Inspector General de Aviación"*). Major Jorge Jordan was the battlefield commander of the Air Forces. They had 104 pilots, 38 aerial gunners-observers, 67 aircraft mechanics and 3 photographers, not counting the NCOs and troops assigned to air bases.

At the beginning of the war, the Bolivian Military Aviation was organised as follows: the *First Air Group* (*"Primer Grupo Aéreo"*) with a *training squadron* (*"Escuadrilla de Entrenamiento"*) at the *Military School of Aviation* with *Caudron C.97* and *Vickers Vendance* trainers; a *fighter squadron* (*"Escuadrilla de Caza"*) with *Vickers Scout*, a *reconnaissance and bombing squadron* (*"Escuadrilla de Reconocimiento y Bombardeo"*) with *Vickers Vespa*, *Breguet XIX* and *Fokker CVb*, and a *transport squadron* (*"Escuadrilla de Transporte"*) with *Junkers F.13/W.34/K.43/Ju.52*.

Combat planes

Six *Vickers Type 143 Scout* fighters were bought in the UK in 1929, which received the serial numbers 7, 8, 9, 10, 11 and 12. Later, three of them received new serials: 54, 59 and 96. They were fitted with two fixed 7.7mm *Vickers Type E* machine guns. They were painted in overall silver dope and had a 450hp air-cooled *Bristol Jupiter VIA* engine. Two Scouts were lost in accidents before the war, in one of them killing Sub-Lieutenant Faustino Rico Toro who had participated in the 1928 raid against Bahía Negra, and the rest participated actively in the Battle of Boquerón, in escort missions to the *Vickers Vespa* bombers.

Vickers Type 143 Scout fighters and *Vickers Vespa* bombers of the Bolivian Military Aviation. (*Jorge Cornejo*)



Curtiss-Wright Hawk II flight line of the Bolivian Military Aviation at Muñoz AFB in 1933. (*Ramiro Molina Alanes*)

Scout serial 96 flown by Captain Pabón shot down *Potez 25A.2* Nr.6 on 4 December 1932. In 1934, the surviving Scouts were sent back to Bolivia to be used as combat trainers and were kept in service until 1935. They belonged to the *Fighter Squadron*.

A total of eight *Curtiss-Wright Model 35A Hawk II* and a single *Model 65 Sea Hawk II* fighters, which received the serials 30, 32 (later 48), 34, 36, 38, 40, 42, 44 and 46, were bought in the US in 1932. Two other Sea *Hawks* were ordered in 1934 but not delivered, apparently seized by customs officials in the neighbouring countries because of the embargo of the League of Nations. They had two synchronised 7.7 machine guns for the pilot. They were kept in a bare metal colour scheme and had a 712hp air-cooled *Wright Cyclone SR-1820F-2* engine. Even though the Hawk was a pure fighter, bomb racks could and were fitted in the Bolivian planes, carrying a total of 200 kilos of bombs. They first saw action in the Second Battle of Nanawa, escorting the Curtiss *Ospreys* that bombed the mentioned Paraguayan fort. Hawk number 30, crewed by Lieutenant Carlos Lazo de la Vega, was shot down by the Paraguayan AA fire on 26 December 1934 in the Puesto Central zone. Major Rafael Pabón flew several missions in the Hawk Nr. 40, also known as the *"Tiger-Hawk"* (*"Tigre-Hawk"*) by the ground crews. The Hawk flown by Lieutenant Emilio Beltran was known as *"Mr. Hawk"* (*"Señor Hawk"*). The Hawk fleet only got one aerial victory when a pair of them shot down *Potez 25* TOE Nr.13 on 11 December 1934, whose crew survived after crash-landing the damaged bomber. Hawk fighters were always used to escort the *Osprey* and *Junkers* bombers and some of them survived the war. They were kept in active service until 1939. The most recognised Hawk pilots were majors Jorge Jordan and Rafael Pabón, and captains José Coello, Luis Ernst, Leónidas Rojas, Juan Antonio Rivera, Alberto Paz Soldán, Emilio Beltrán, Alberto Alarcón, Fabian Monasterios, José Chacón and Luis Paredes.

The most numerous fighters in the Bolivian Military Aviation were the *Curtiss-Wright CW-C14R Osprey.* Twenty *Ospreys* were bought in the US in 1933 and they received the serial numbers 11, 13, 20, 22, 25, 30, 39, 45, 50, 60, 62, 64, 68, 78, 87, 91, 93 and 95, plus two machines that did not receive any serial because of early accidents. They were painted in overall silver dope and some of them had a black engine cowling. They were powered by a 420hp air-cooled *Wright Whirlwind R-975E-2* engine. Several *Ospreys* were damaged beyond repair in accidents because of their high landing speed and the poor conditions of most runways in the Chaco. The *Ospreys* had a fixed *Colt MG40* machine gun for the pilot and a movable one of the same type for the gunner, and could carry a total of 118 kilos of bombs. Captain Arturo Valle and Lieutenant Max Ardiles were shot down in an *Osprey* by AA-fire during a recce flight in the Toledo area on 25 February 1933. Major Rafael Pabón and his gunner Sergeant Mario Calvo were killed in *Osprey* Nr. 78 when they were shot down by *Potez 25* TOE Nr. 11, crewed by Captain Carmelo Peralta and Lieutenant Rogelio Etcheverry, on 12 August 1934. The *Osprey* fleet participated in almost all remaining dogfights in the war and some of them survived. They were kept in service until 1946. Some of the most famous *Osprey* pilots were majors Jorge Jordán and Rafael Pabón, captains José Coello, Luis Ernst, Leónidas Rojas, Alfredo Pascoe, Eliodoro Nery, Luis García, Luis Paravicini and Juan Antonio Rivera, and lieutenants Alberto Paz Soldán, Arturo Valle, José Arzabe, Aurelio Roca, Claudio López, José Abdón Vargas, Alberto

A Bolivian *Curtiss-Wright CW-C14R Osprey*. (*Ramiro Molina Alanes*)

Montaño, Juan Pando, Luis Paredes, José Chacon, Jorge Eulert, Luis Soria, Fabián Monasterios and Raul Ernst.

Bombers and reconnaissance planes

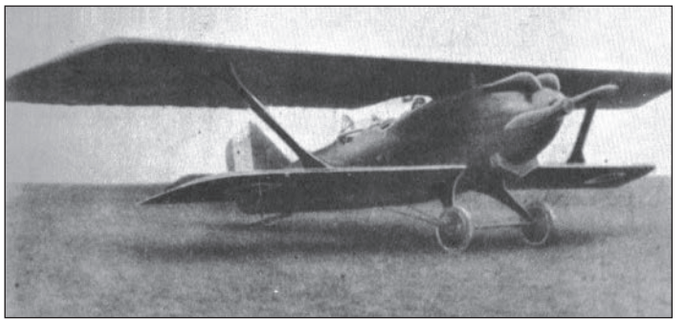
Five *Fokker CVBs,* which received names instead of serial numbers – *"Fokker 1", "Fokker 2", "Sgt. Max Paredes", "Bolivia"* and *"Mariscal Sucre"* – were bought new in The Netherlands in 1925. They had a fixed *Vickers Type E* machine gun for the pilot and a movable one for the gunner, and could carry up to 200 kilos of bombs. They were painted in overall dark green and had a 520hp water-cooled *Hispano Suiza* engine. One of them was destroyed in an accident before the war, in a flight between La Paz and Rio de Janeiro. Another Fokker, the *"Bolivia",* bombed the Paraguayan forts of Bahia Negra, Patria and Galpón in a December 1928 retaliation mission described earlier. When the war broke out in June 1932, all the surviving *Fokker* remained in Bolivia to train bomber pilots and they were kept in service until 1939. They belonged to the *Reconnaissance and Bombing Squadron.*

Also in 1925, two *De Havilland DH.9s,* which were serialled as AM-1 and AM-2, were bought. They had an overall metal dope colour scheme and were powered by a 240hp *Armstrong Siddeley Puma* engine. It had a *Vickers* machine gun for forward firing, a couple of *Lewis* mounted on a scarff ring in the rear cockpit, and could carry up to 144 kilos of bombs. These aircraft were used in exploration flights in the Chaco before the war and were kept as trainers in Bolivia during the conflict.

Between 1924 and 1929, the Bolivian government bought seven *Breguet XIX A.2* bombers in France. They all received names instead of serial numbers: *"Potosi", "Ingavi", "La Paz", "Boquerón", "Batallón Colorados"* and *"Uncía"*. They were equipped with a fixed *Vickers Type E* machine gun for the pilot and a movable one on a *scarff* ring for the gunner, and could carry up to 400 kilos of bombs. Some of them were painted in overall dark green and the rest in silver dope. The first three were powered with a 450hp water-cooled *Lorraine* engine and the rest with a 500hp water-cooled *Hispano-Suiza 12* engine. The *"Ingavi"* was destroyed in an accident before the war. When the conflict broke out, only three *Breguet* were in flying condition and were used in the first months of the war in the Chaco. Once the Curtiss fighters and bombers arrived, they were transferred to the Military Aviation School for pilot training. They were withdrawn from service in late 1934. They also belonged to the *Reconnaissance and Bombing Squadron*.

Six *Vickers Vespa Mk.III Type 149* bombers, which received the

Some of the most famous Bolivian fighter pilots. (*Alas de Bolivia* by Amalia Villa de la Tapia)



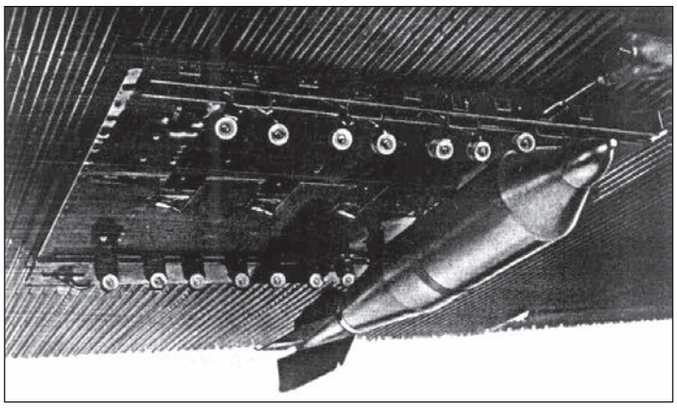
A Bolivian *Breguet XIX*. (*Alas de Bolivia* by Amalia Villa de la Tapia)

The Bolivian *Vickers Vespa Mk.III Type 149*, serial 5. (*Ramiro Molina Alanes*)

From left to right: 80, 50, 30, 25, 15 and 10-kilo bombs used by the Bolivian Military Aviation. (*Alas de Bolivia* by Amalia Villa de la Tapia)

serials 1 to 6, were bought in the UK in 1929. Three additional Vespa, to be used as spares, were also bought but they were assembled and went into active service with the serials 18, 23 and 44. They were painted in overall silver dope and had a 450hp air-cooled *Bristol Jupiter VI* engine. Vespa Nr. 3 was lost in an accident in Santa Cruz in 1930. In the first two years of the war, they were used as bombers and recce planes, normally escorted by the Scout fighters, especially during the battles of Boquerón, Toledo and Saavedra. Vespa Nr. 5 was shot down by the Paraguayan AA-guns

Bolivian officers posing in front of a *Junkers K.43*. (*Ramiro Molina Alanes*)



Junkers K.43 bomb rack. (*Deutsches Museum*)

A *Junkers K.43* (right) with a *Sikorsky S.38*, a *Junkers F.13* and another *Junkers K.43*. (*Mark Christie Wörner*)

on 31 July 1932; its crew, Lieutenant Belmonte and Sub-Lieutenant Saavedra, was captured by Paraguayan troops. Vespa Nr.23 was lost in an accident in 1934. With the arrival of the more modern and faster Curtiss fighters and bombers, they were withdrawn from the battlefront and kept as trainers in the Military School of Aviation until 1935. They belonged to the *Reconnaissance and Bombing Squadron*.

Three *Junkers K.43* bombers were bought in 1934 in Germany for the military aviation. They received the serial numbers 101 to 103. They had an air-cooled 600hp *Pratt & Whitney Hornet C* engine and were painted in dark green in the upper surfaces and light grey underneath. Although also used as transports, they performed numerous bombing raids against Paraguayan positions in the Chaco. They could carry a single 100-kilo bomb and two 50-

A Bolivian *Curtiss-Wright Cyclone-Falcon*. (*Ramiro Molina Alanes*)

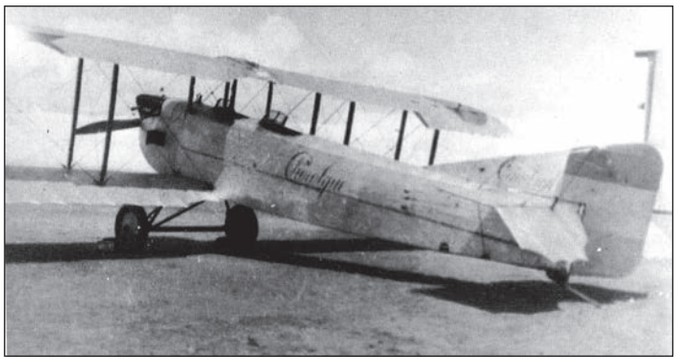
kilo bombs under each wing. For defence, they were fitted with a 7.65mm Colt machine gun mounted on a scarff ring on top of the fuselage. K.43 serial 103 was destroyed in an accident in 1935 and the other two survived the war. All machine guns and bomb racks were removed and they were reconditioned as transport planes for the *LAB*. They were kept in service until 1943.

In 1934, nine *Curtiss-Wright Cyclone-Falcon* were bought in the US. They received serials 201 to 209. They had a single forward .30 machine gun for the pilot and a similar one for the gunner in the rear cockpit and could carry up to 200 kilos of bombs. Two of them had a half-cockpit canopy for the crew and three-bladed propellers. They were painted in overall silver dope and had a 712hp air-cooled *Wright Cyclone SR-1820F-2* engine. Four of them were destroyed in accidents and two were shot down by Paraguayan AA-guns during the war in March 1935. The remaining three survived the conflict and were used as glider tug planes in the post-war period until 1951. The most famous Falcon pilots were Captain Juan Antonio Rivera and lieutenants Alberto Paz Soldán, Emilio Beltran, Fabián Monasterios, José Chacon, Alberto Montaño and Luis Paredes. They all belonged to the *Reconnaissance and Bombing Squadron*.

Trainers

In 1926, the Bolivian government bought five *Caudron C.97* trainers from France, which received names instead of serial numbers: *"Illampu"*, *"Chorolque"* (later *"Capitán Valle"*), *"Sajama"*, *"Sgt. Flores"* (later *"Oruro 1"*), and *"Illimani"*. They were painted in overall silver dope and had a 180hp water-cooled *Hispano Suiza H.1* engine. When the Chaco War broke out, only one C.97 was in flying condition and was kept in service until 1934. Only three *Vickers Type 155 Vendace III trainers* were bought in 1929, which received the serial numbers 1 to 3. They were painted in overall silver dope and had a 330hp water-cooled *Hispano Suiza 8F* engine. Vendace Nr.1 and 2 were destroyed in accidents in 1931, and Nr. 3 was burned out by Bolivian troops before withdrawing from Fort Saavedra on 11 December 1933.

Three *Junkers A.50fe Juniors* were bought in 1930 for the *LAB* aviation school and received the names *"Piray"*, *"Warnes"* and *"Acre"*. They were kept in their original bare metal scheme and were powered by an 80hp air-cooled *Armstrong Siddeley Genet* engine. Once the war broke out, they were transferred to the military aviation. The Juniors were used as trainers in Roboré and Puerto Suárez AFB and also used in liaison missions. The Junior *"Acre"* was destroyed in an accident in 1933, and the remaining two



The Bolivian *Caudron C.97 "Chorolque"*. (*Ramiro Molina Alanes*)

A Bolivian *Vickers Vendace*. (*Ramiro Molina Alanes*)

A Bolivian *Curtiss-Wright CW-16E Trainer*. (*Ramiro Molina Alanes*)

survived the war and were given back to the LAB, where they were kept in service until 1940.

Three *Curtiss-Wright CW-16E Trainer* aircraft were acquired in the US in 1934, which received the serials *Trainer 1, 2* and *3*. They had an overall silver dope colour scheme and were powered by a 175hp air-cooled *Wright Whirlwind R-540E-2* engine. They were intensively used as trainers in the city of Villamontes. One was destroyed in an accident in 1934 and the other two survived the war. They were withdrawn from service in 1938. All the trainers belonged to the *Training Squadron*.

Transport planes

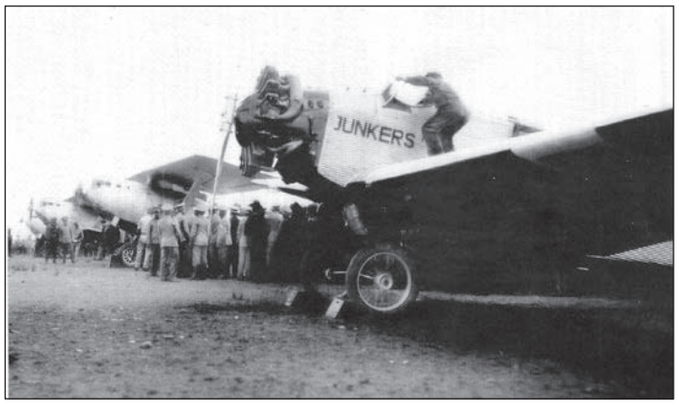
Almost all Bolivian transport planes belonged to the *Lloyd Aéreo Boliviano* (*LAB*) airlines and had been transferred to the *Transport Squadron* of the military aviation at the beginning of the war.

In the first 20 years of existence, the list of German pilots flying in the LAB included Wilhelm Neuenhofen, Werner Günter, Arnold Hermers, Max Schnirring, Erick Schulze, Alfred Grunke, Jörg Joas, Ernst Edler, Robert Mossbacher, Wolfgang Leander, Emil Kastner, Karl Sailer, Hermann Berndt, Arthur Schneider, Hermann Schroth, Jörg Jüeterbock, the Estonian Harold Stunde, the Russian Pedru Kudriazef, the Yugoslavian Drago Balzareno, and the Bolivians Jorge Wilstermann, Walter Calvi, Luis Soria, Emilio Beltrán, Alberto Alarcón, Juan Antonio Rivera, Sinesio Moreno, Alberto Paz Soldán and Armando Suárez. The German technicians were Gustav Pannier, Nieman, Kurt Wörner, Konle, Jack Mayer, Schward, and the Bolivian technicians were Juan Román, René Galvarro, Carlos Villarroel, Arturo Meleán and Ríos Toro.

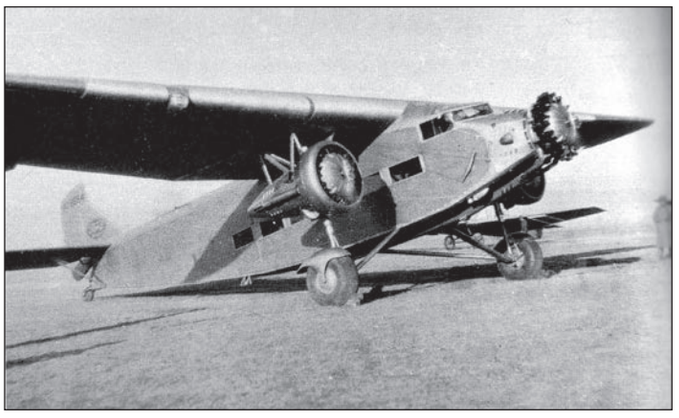
A total of nine *Junkers F-13* saw service in the LAB from 1925,

Lloyd Aéreo Boliviano emblem between 1929 and 1941. (*Lloyd inflight magazine*)

Six LAB *Junkers F-13* at Cochabamba air strip in May 1928. (*Ramiro Molina Alanes*)

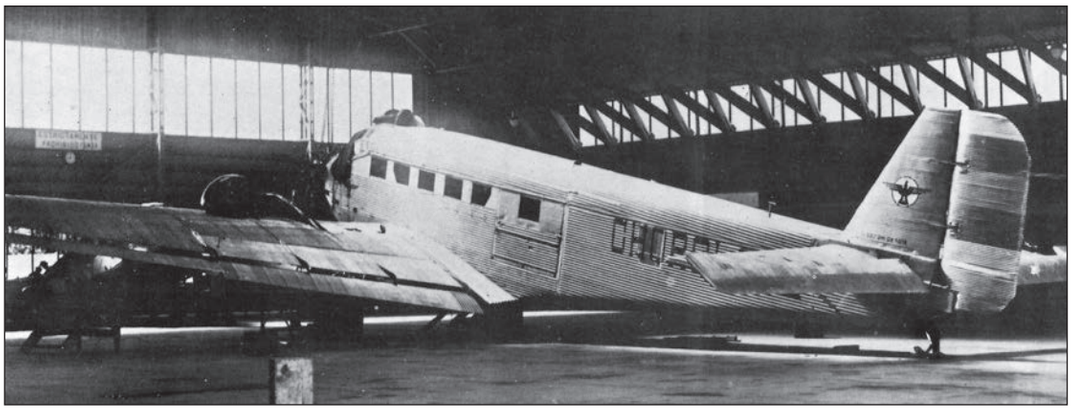


A Bolivian *Junkers W.34ci* together with some *Breguet XIX*. (*Mark Christie Wörner*)



The only Bolivian *Ford 5-AT-D Trimotor*. (*Ramiro Molina Alanes*)

of which six were *F-13L* (land planes) and three were *F-13L/W* (hydroplanes). The *F-13W* could be converted to *F-13L* according to necessity. Originally the *F-13Ls* received the following names: *"El Oriente", "Oriente II", "Beni II", "Beni III", "Illimani"* and *"Charcas"*. They were fitted with a 300hp water-cooled *BMW IV engine*, and kept their overall bare metal scheme with black engine cowling. They could accommodate two crew members and four passengers. At least one, the *"Illimani"*, received a tactical cammo during the war. The *F-13L/Ws* were the *"Beni"*, *"Mamore"* and *"Chaco"*. *Five of them, "El Oriente", "Oriente II", "Beni", "Beni II" and "Chaco"*, were lost in accidents before the war. When the



LAB *Junkers Jr.52/3m "Chorolque".* (*Ramiro Molina Alanes*)

The LAB *Junkers Ju.52/3m* named *"Bolivar".* (*Ramiro Molina Alanes*)

The LAB *Sikorsky S.38B "Nicolás Suarez".* (*Ramiro Molina Alanes*)

LAB Junkers Ju.52/3m "Huanuni". (*Mark Christie Wörner*)

Chaco War broke out, four F-13 were in flying condition. They carried out innumerable transport missions from La Paz to the battlefront. *"Charcas"* was lost in an accident during a severe storm in 1934. The three surviving F-13s returned to LAB at the end of the conflict and were kept in service until 1941. Bolivians called them *"lata piscko"* (meaning "tin bird" in Quechua language).

Three *Junkers W.34ci* were bought in Germany in 1929 for the *Lloyd Aéreo Boliviano*, which received the names *"Tunari", "Vanguardia"* and *"Presidente Siles"*. They kept their bare metal scheme and had a 525hp air-cooled *Pratt & Whitney Hornet A* engine. They could accommodate two crew members and six passengers. They were transferred to the military aviation at the beginning of the Chaco War and were used as transports. They actively participated in the Boquerón airlift and many other missions. *"Presidente Siles"* was destroyed in an accident in 1935 and the other two returned to the LAB where they were kept in service until 1942.

A single *Ford 5-AT-D Trimotor* was bought in 1932 and received the name *"Cruz del Sur"* (Southern Cross). It was kept in its bare metal scheme and was powered by three 420hp *Pratt & Whitney Wasp* engines. It could accommodate 2 crew members and 17 passengers. It was completely destroyed in a fatal accident in Villamontes in October 1932, apparently because of overloading.

Four venerable *Junkers Ju.52 3/m* trimotors saw active service in the *LAB* in the Chaco War from 1932. They received the names *"Chorolque", "Huanuni", "Juan del Valle"* and *"Bolivar"*. They originally came in bare metal scheme but some received a tactic cammo. They were powered by three 575hp air-cooled *Pratt & Whitney Hornet S4-D1* or 525hp *Hornet A1* engines. They could accommodate 2 crew members and 17 passengers. As soon as

the war broke out, they were transferred to the military aviation together with their crews. They were intensively used to transport troops, wounded soldiers and different kinds of heavy cargo. All four *Ju.52* survived the war and returned to the *LAB*. Three of them were lost in accidents: *"Chorolque"* in 1936, the *"Huanuni"* in 1937 and the *"Juan del Valle"* in 1940. The only surviving sample, the *"Bolivar"*, was sold to *Aeroposta Argentina* in 1943. After the war, *LAB* bought a fifth sample, the *"Illampu"*, which obviously did not have any connections with the military aviation and was later sold to VASP in Brazil.

Two *Sikorsky S.38B* saw service in the *LAB*, which received the names *"Nicolás Suarez"* and *"Marihui"*. They were powered by two air-cooled 425hp *Pratt & Whitney Wasp* engines and could accommodate two crew members and six passengers. They were never transferred to the military aviation and were kept as fast transport planes in Bolivia, though at least the *"Nicolás Suarez"* carried out some flights to the war zone. This plane was destroyed in a fatal accident in 1941, killing a Chaco War veteran, Captain Emilio Beltrán.

CHAPTER 6

CHACO AIR WAR CHRONOLOGY

The pre-war period (1923–1932)

On 3 January 1920, the then President of Paraguay, Dr José P. Montero, signed the Decree Nr. 11,027, which authorised the construction of a building for the *Military Aviation School* (*"Escuela de Aviación Militar"*) in a field near Asunción called Ñu-Guazú (which means *"Big Field"* in the Guaraní language). On 6 November 1920, Captain Hernán Dahlquist was appointed as the first director of the Military Aviation School in Paraguay. The first instructor was a First World War veteran German pilot, First Lieutenant Oscar Grave, and the first students were Mateo Telles, Aniceto García, Atilio Ibáñez Rojas, Eulogio Osorio and N. García. The lack of airplanes meant they just had lectures on the subject and prepared the infrastructure for the future acquisition of trainers.

During the revolution of 1922, Captain *Ramón Ortiz* was appointed as general director of the Military Aviation School on 2 September. Although no pilot courses were still available, the government had hired foreign personnel who brought the first aircraft to fight the rebels.

On 22 February 1923, the Decree Nr. 15,787 officially authorised the foundation of the *Military Aviation School*. Sergeant Nicola Bo was appointed as general director, and Giuseppe Bo and Giuseppe Barbenza were the first mechanics – the three of them Italian citizens and First World War veterans. The first *"fleet"* consisted of only five aircraft: one *Ansaldo SVA-5*, one *SVA-10*, a *SPAD S.XX* and two *SAML A.3s*. Unfortunately courses did not start and a year after that, Bo travelled to Italy, so the new director was Captain José D. Jara with First Lieutenant PAM Emilio Nudelman as his assistant. They both became pilots in Brazil in the early 1920s. Still, with all those changes, no pilot or mechanic training courses were offered. It was then that the government decided to hire a French military mission to reorganise not only the army but also the military aviation. The members of this mission, whose director was Colonel Joseph Coulet, arrived in Paraguay on 31 March 1926. Two of his members were appointed to the Military Aviation School: Captain Louis Fromont, who received the rank of Major Honoris Causa, and Sergeant Robert Pommier. Soon after their arrival, they suggested the acquisition of French aircraft for the Military Aviation School. Just a year after their arrival, the *Hanriot HD.32*s and the *Morane-Saulnier M.S.35/139* arrived. All the training courses started on 1 June 1926. In 1927, the Paraguayan military mission in Europe signed several contracts for the acquisition of combat planes – seven *Potez 25A.2* bombers (but only six arrived; one was damaged while being unloaded at the port of Montevideo) and seven *Wibault 73C.1* fighters – together with spare engines, machine guns, bomb racks, cameras and even radio transmitters. All this material arrived in Paraguay between 1928 and 1929.

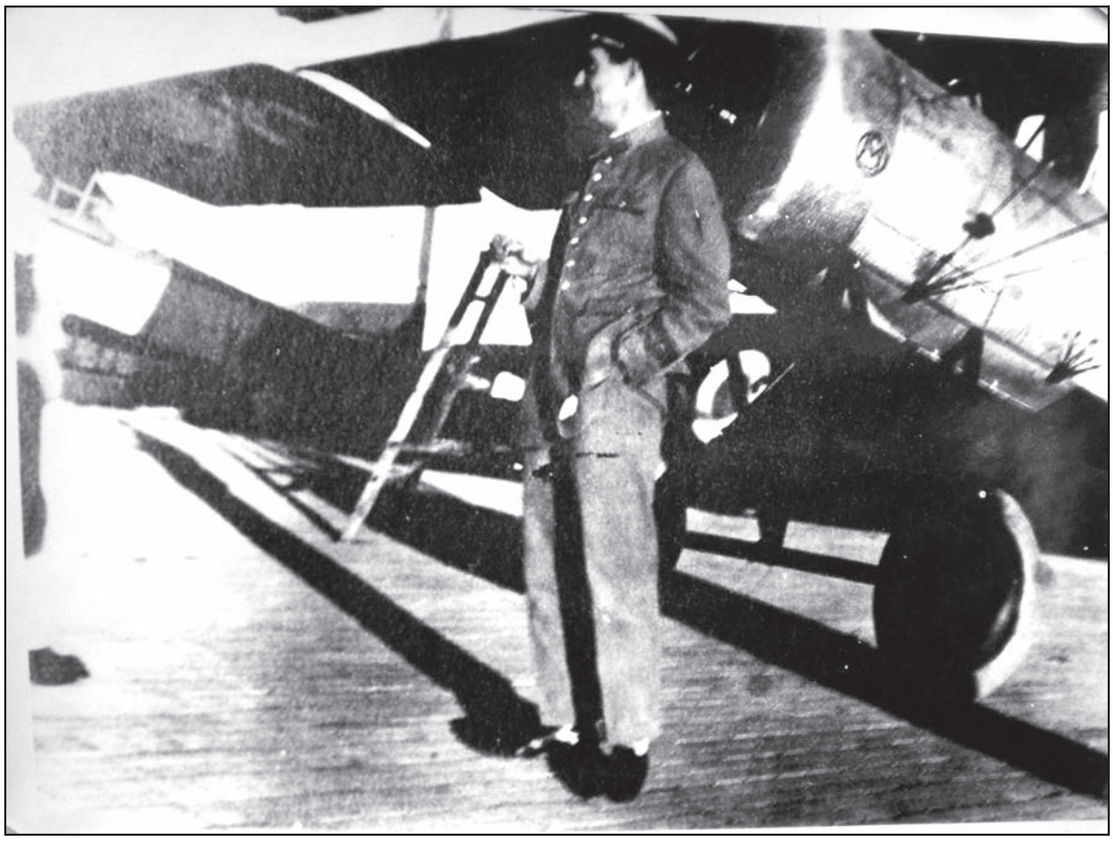
The *Military Aviation School* main building at Ñu-Guazú in the early 1930s. This building still exists with minor changes. (*Colonel PAM Ret. Enrique Déntice*)

On 25 March 1928, the first promotion of pilot officers received their wings in a ceremony that took place at Ñu-Guazú AFB. The then President of Paraguay, Dr Eligio Ayala, personally handed in all the diplomas and pilot wings to first lieutenants PAM José María Fernández, Miguel Ángel Yegros and Leandro Aponte, and second lieutenants PAM Juan González Doldán, Ramón Della Loggia, José Gregorio Morínigo, Atilio Ibáñez Rojas, Trifón Benítez Vera and Víctor A. Vallejos.

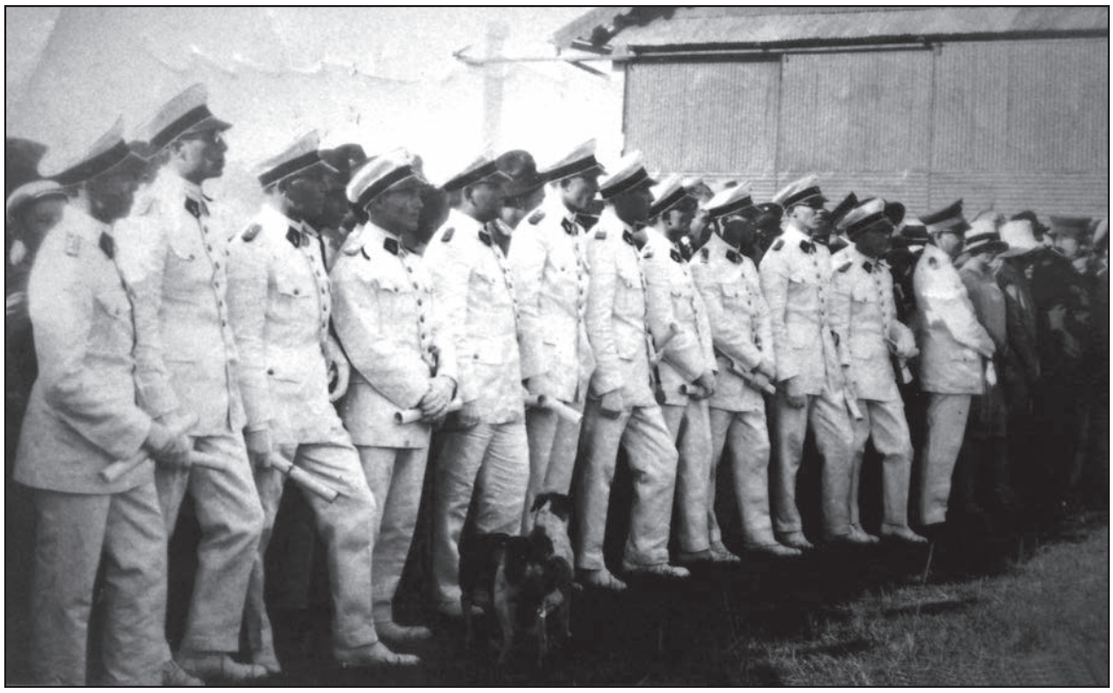
On 31 August 1928, the first promotion of aircraft mechanics graduated from the Military Aviation School. They were NCOs MAM Federico Voitchach, Ernesto Guido, Lauro Keim, Basilicio Acosta and Leopoldo Schroeder.

On 14 January 1930, the second promotion of aircraft mechanics graduated from the Military Aviation School: NCOs MAM Evacio Perinciolo, Hermes Gómez, Agustín Pasmor, Evaristo Karjallo, David Demestri, Carlos Rocholl, Anastacio Cáceres, Juan Zavala Spika, Cayetano Santacruz and Manuel Lenguaza.

The second promotion of military pilots graduated on 22 April 1930, including First Lieutenant PAM José Atilio Migone and



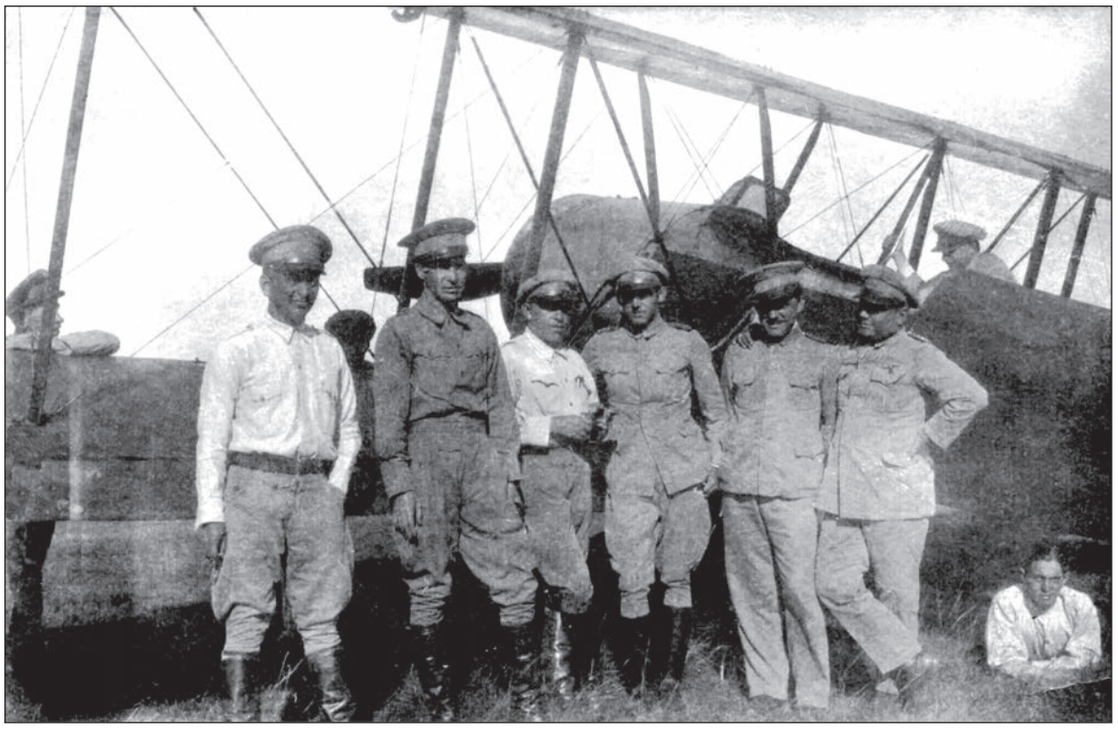
Major HC Louis Fromont with the *Morane-Saulnier* trainers at the Military Aviation School. (*Instituto de Historia y Museo Militar del MDN*)



The first promotion of the *Military Aviation School* cadets at the graduation ceremony in 1928. All cadets were in fact army officers. (Instituto de Historia y Museo Militar del MDN)

second lieutenants PAM Tomás Rufinelli, Isidoro Jara Cardozo, Emilio Rocholl, Walter Gwynn, César Sisa, Ernesto Quiroz, Carmelo Peralta, Luis Escario and Román García.

The French military mission left the country in 1930, leaving precious trained personnel and a well-established Military Aviation School. The government then appointed Lieutenant Colonel HC Ernesto Colombo as director of school and he also continued being the director of the Naval Aviation School. Colombo tried to reorganise the military aviation with the creation of an air combat group, which included a fighter squadron, a bombing and reconnaissance squadron, and transport and training squadrons, which constituted the base of the later organisation of the Air Arm during the Chaco War, but in 1931 he was substituted by an infantry colonel, Paulino Ántola, as an acting commander for just a couple of months, and then by Captain PAM Juan José Benitez, who at least was a pilot. To optimise the brilliant job done by the French military mission, the government decided to hire another mission, but this time from Argentina. On 6 April 1931, Major HC Jorge Souvillé was appointed director of the *Military Aviation School*. During his administration, a transport squadron was



Some Paraguayan Air Arm pilots posing next to a *Hanriot HD.32* primary trainer at Ñu-Guazú AFB in 1931. (*Instituto de Historia y Museo Militar del MDN*)

The Paraguayan Military Aviation School badge. (*Author's files*)

added to the existing squadrons.

When the Argentinean military mission returned to its country in 1932, another Argentinean took charge of the school, this time a First World War veteran in the French aviation, Major HC Vicente Almandos Almonacid. His presence was very valuable for the young Paraguayan pilots since Almonacid taught them the art of air combat, based on his ample experience in France during the First World War. He was never tired of saying that the Bolivian Military Aviation was very powerful and when the fighters would attack the slow *Potez 25* bombers, the Paraguayan pilots should reduce the speed almost to stall, flying at tree-top level, changing course every 10 or 15 seconds; the fast Bolivian fighters would not be able to stay the necessary time at six o'clock to shoot down the bombers and, of course, they would be exposed to the *Potez* rear

Ground personnel with a *Wibault 73C.1* fighter at Isla Poi AFB in September 1932. (*Instituto de Historia y Museo Militar del MDN*)

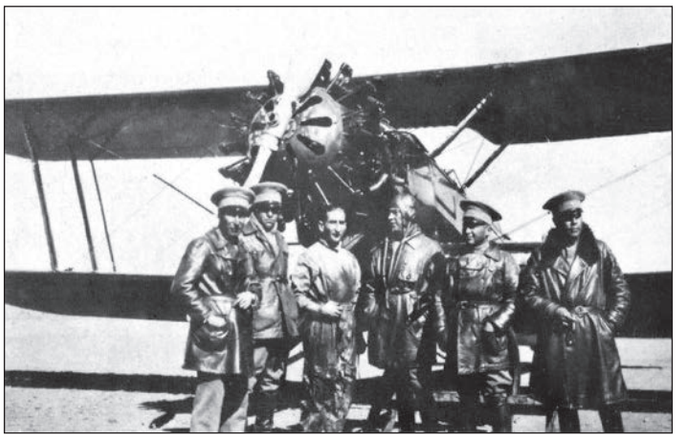
A *De Havilland DH-60 Gypsy Moth* of the Transport Squadron at Ñu-Guazú AFB in 1932. (*Instituto de Historia y Museo Militar del MDN*)

twin Madsen defensive machine guns. This kind of tactic saved many lives in the dogfights to come.

The Paraguayan Air Arm was organised in a *General Aviation Administration* (*"Dirección General de Aviación"*) whose main office was at Ñu-Guazú AFB. It included a *Department of Materials and Supplies* (*"Dirección de Material y Suministros"*), a *Staff and Personnel Department* (*"Dirección del Personal"*) and the *Military Aviation School* (*"Dirección de la Escuela de Aviación Militar"*), which had training and transport squadrons, all of them in the above mentioned base. The *Department of the Aviation in Campaign* (*"Dirección de la Aviación en Campaña"*), also called *First Aviation Group* (*"Primer Grupo de Aviación"*), which included the first and second reconnaissance and bombing squadrons, and the first and the eleventh fighter squadrons, was at *Isla Poí* AFB (meaning *"Thin Island"* in Guaraní) in the Chaco. The top military aviation authority was the director of general aviation in Asunción, the capital, who was Major HC Vicente Almandos Almonacid first and then Navy Lieutenant Commander José Bozzano. The battlefield commander of the Paraguayan Air Arm was at *Isla Poí* AFB, who was Major PAM José Atilio Migone and Captain PAM Leandro Aponte as deputy commander. The Paraguayan Air Arm had a total of 54 pilots, 23 aerial gunners–observers, 64 aircraft mechanics and 4 photographers, not counting the NCOs and troops assigned to guard the air bases.

On the other hand, the first attempt to create a Military Aviation School in Bolivia was on 9 September 1916 through a decree issued by the President General Ismael Montes, without success. Then on 23 June 1920, President Gutierrez Guerra issued a supreme decree creating the Military Aviation School at *El Alto* aerodrome near La Paz, the capital. The first director was Lieutenant Colonel Victorino Gutierrez, the chief pilot was Lieutenant Colonel Donald Hudson and the instructors were captains René Pareja and Alfonso Crespo, and lieutenants Bernardino Bilbao Rioja and Ernesto Arevalo. But once again, because of the lack of funds and airplanes, Bolivians had to wait three more years to have an operational school. In

From left to right: Sub-Lieutenant Faustino Rico Toro, Major Hans Haeberli (Swiss instructor), Lieutenant Colonel Genaro Blacut (EMA director), Captain Felipe Von Vacano (instructor) and Lieutenant José P. Coello, posing with a *Caudron C.97* trainer. (*Alas de Bolivia* by Amalia Villa de la Tapia)



Left to right: Lieutenant Coello, Lieutenant Pando, the Mexican aviator Pablo Sidar, Captain Santalla, Lieutenant Nery and Lieutenant Pabón, posing in front of a Mexican army aviation *Douglas O-2M* at *El Alto AFB* in 1929. (*Revista Actualidad Aeronáutica* – Fuerza Aérea Boliviana)

1921, four *Morane-Saulnier M.S. 35 ep2* and two *Morane-Saulnier Type G "Pinguinos"* (penguins, used to practice taxiing) were bought for the school but they arrived in 1923. Once the trainers were ready, President Bautista Saavedra officially founded the Military Aviation School on 7 September 1923. Lieutenant Colonel Juan Fernandez was appointed as general director, with Captain Eduard Deckert, a French aviator, as chief pilot, and Lieutenant André Ceradin, also French, as chief mechanic, both members of a French military mission in Bolivia. The school accepted not only military officers and NCOs as students but also civilians, including a woman.

In 1925, five *Caudron C.97* trainers were incorporated into the Military School of Aviation, whose director was Major Bernardino Bilbao Rioja. After the French military mission left, a Swiss one headed by Major Hans Haeberli was hired. Also in 1925, the first Bolivian airline was founded, the *Lloyd Aéreo Boliviano* (*LAB*) with a single *Junkers F.13L,* named "*El Oriente*", donated by the German colony in the country. Two years later, the *LAB* created a flying technical school in Cochabamba and eventually six more *F.13s* were bought.

Once the war broke out, the Military School of Aviation opened a few branches near the battlefront at Cururendá, Samayhuate, Choreti, Muñoz, Ballivián and Villamontes.

The war period (1932–35)

Two months before the beginning of hostilities, a Bolivian *Vickers Vespa*, crewed by majors Jorge Jordán and Oscar Moscoso, carried out a recce flight over the *Chuquisaca* (*Pitiantuta* for Paraguay) lagoon in the Central Chaco region. They took off from *Muñoz* AFB and flew northwards towards Camacho and then northeast to the lagoon to check the Paraguayan troop concentration in the area, to finally return to their base. In June, when the first skirmishes took place in that area, the Bolivian government decided on the immediate mobilisation of the military aviation, so a *Breguet XIX* squadron was sent to *Muñoz* AFB. It took off from La Paz and after a technical stop in Villamontes, finally arrived at the most advanced air base in the Chaco, in *Muñoz.* From there, the Breguets carried out several recce missions to the battlefront, being joined later by some *Vickers Vespa* bombers, *Scout* fighters and even the *Vendace* trainers, and, of course, some *Semag-Becker* AA-guns were also deployed there.

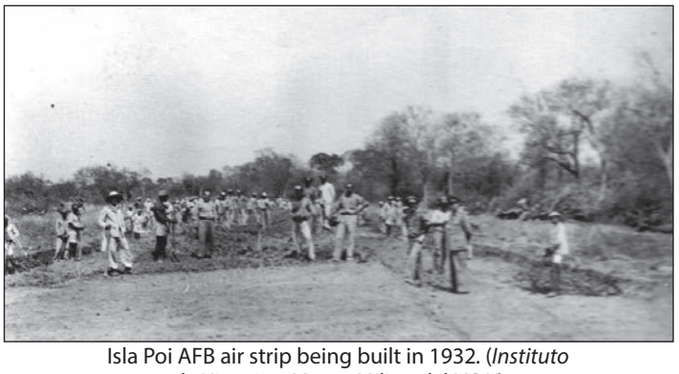
There were no more than 20 air combats during the Chaco War. This was because the battlefront was very wide, more than 500 kilometres, so both Air Forces rarely coincided in the same place. Besides, the commander-in-chief of the Paraguayan Army ordered that all Paraguayan planes should not look for combat; the bombers should focus exclusively on bombing and reconnaissance missions, being escorted by the fighters. Taking the Bolivian fighter superiority into account, the Paraguayan ones would only defend the bombers.

There were no aces in the Chaco War. Only four aircraft were shot down in dogfights: two Paraguayan *Potez 25*s, and two Bolivian Curtiss *Ospreys*; five Bolivian planes were also shot down by AA fire against none on the Paraguayan side. Major Rafael Pabón, regarded as an *"ace"* by his nationals, could only shoot down one Paraguayan *Potez 25* before he himself was shot down by a similar bomber two years later.

Many aircraft were lost in the Chaco because of accidents, on both sides, mainly due to the rugged conditions of most runways, mechanical problems and the weather, causing severe injuries and even death.

Muñoz AFB. (*Alas de Bolivia* by Amalia Villa de la Tapia)

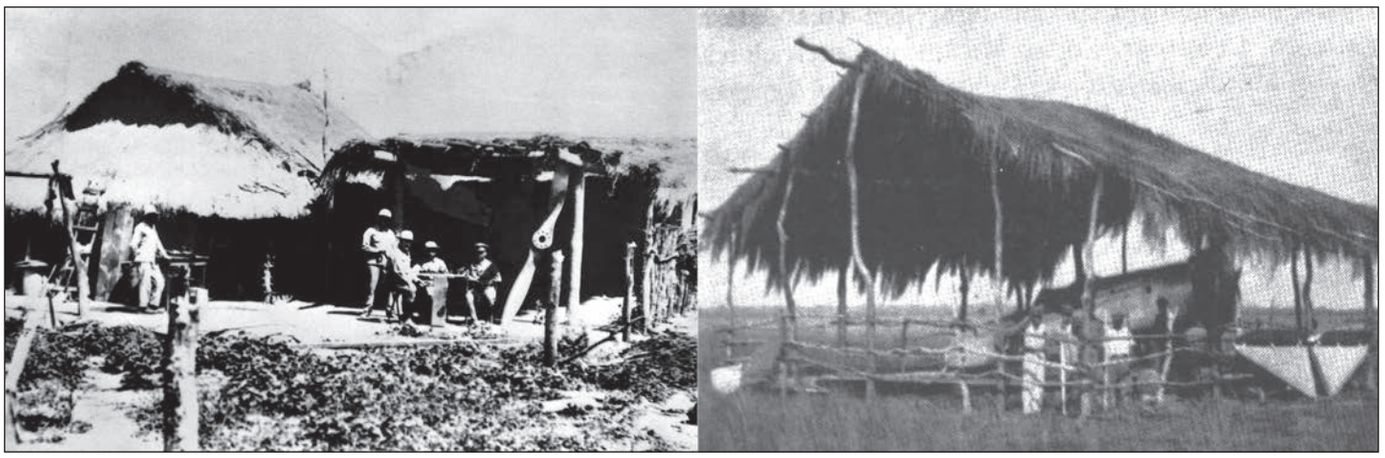
NCO MAM Evasio Perinciolo in the gunner's rear cockpit of a *Potez 25A.2* bomber. The two auxiliary tanks can be seen under the upper wing. (*Instituto de Historia y Museo Militar del MDN*)



Isla Poi AFB air strip being built in 1932. (*Instituto de Historia y Museo Militar del MDN*)

The Bolivian air operation plans

There were two plans for air operations in the Chaco: the one organised by Lieutenant Colonel Bernardino Bilbao Rioja consisting of air raids against all the Paraguayan ports on the Paraguay River, and a close support to the land forces from the air bases of Muñoz, Arce, Florida and Puerto Suarez. The other plan was elaborated by Major Jorge Jordán with special attention paid to the defence of oil wells at Camiri and Sanandita, and also the town of Villamontes and the *Parapetí* (*Parapití* for Paraguay) River, from the air bases of Villamontes, Yacuiba, Cuevo and Charagua. Both plans were disregarded by the Bolivian high command.



Aircraft maintenance in the Chaco. Paraguayan Air Arm maintenance unit at Isla Poi AFB (left) and Bolivian Military Aviation at Muñoz AFB (right). (*Instituto de Historia y Museo Militar del MDN* and *Alas de Bolivia* by Amalia Villa de la Tapia)

Lieutenant Colonel Bernardino Bilbao Rioja. (*Fuerza Aérea Boliviana*)

Sub- Lieutenant Armando Saavedra (centre) after being shot down and captured by Paraguayan troops, together with Lieutenant Elias Belmonte. (*Instituto de Historia y Museo Militar del MDN*)

The first Bolivian plane shot down

The first military actions of the war took place on 15 June 1932 in the *Pitiantuta* (*Chuquisaca* for Bolivians) lagoon. A little more than a month after that on 27 July, the Bolivian *Vickers Vespa* serial 5, crewed by Lieutenant Elias Belmonte as the pilot and Sub-Lieutenant Armando Saavedra as the gunner–observer, was flying on a recce mission in the *Fort Aquino* zone. Since they were aware that Paraguay did not have any AA guns, they were flying very low; that caught the attention of some Paraguayan troops nearby who began shooting at the plane with their rifles, hitting its engine. Lieutenant Belmonte could not control the plane and crash-landed it, and both crew members survived the impact but were immediately captured to spend the rest of the war in captivity.

The first Paraguayan planes deployed to the Chaco

On 1 August 1932, *Potez 25A.2* serial 6, crewed by First Lieutenant PAM Trifón Benitez Vera and Captain Obs. Aer. Ramón Avalos Sanchez, took off from Ñu-Guazú *AFB* to *Port Casado* in the Chaco. Some days before, ground personnel were taken to *Punta Rieles* (the end of the Casado railway) to choose an appropriate piece of land to build an air strip in the surroundings. The group was led by the then NCO MAM Agustin Pasmor, maintenance chief of the Paraguayan Air Arm, who finally found a very convenient place just 4 kilometres south of the railroad. The maintenance crew, with the help of some soldiers, cleared the land by removing tree branches, vegetation and stones, covered holes on the ground and prepared the aircraft shelters in the forest nearby. These shelters were prepared by cutting the lower branches of tall trees, so aircraft could be hidden from the enemy flying above.

They also built some huts using adobe for the walls and straw for the roof to be used as offices, dormitories and a maintenance workshop. The first Paraguayan air base took shape and it received the name of *Isla Taguató* (Eagle Island). Once everything was set up, three *Potez 25A.2* bombers, serials 4, 5 and 6, arrived, crewed by first lieutenants PAM Atilio Ibáñez Rojas and Trifón Benítez Vera and Second Lieutenant PAM Román García as pilots, and lieutenants PAM Carmelo Peralta, Isidoro Jara and Emilio Rocholl as gunners, although they were also pilots. The *First Reconnaissance and Bombing Squadron* was already in the Chaco ready for action.

At the end of August, two more *Potez 25A.2*, serials 1 and 3, arrived at *Isla Taguató*, as well as three *Wibault 73 C.1* fighters,

Second Lieutenant PAM Roman Garcia (centre) with some NCOs at Ñu-Guazú AFB in 1932 with a couple of *Potez 25A.2* bombers. (*Instituto de Historia y Museo Militar del MDN*)

A Maxim machine gun used by Paraguayan troops for AA fire. (*Instituto de Historia y Museo Militar del MDN*)

First Fighter Squadron *Wibault 73 C.1* serials 5, 23 and 6 at Isla Poi AFB in September 1932. (*Instituto de Historia y Museo Militar del MDN*)

A *Potez 25A.2* bomber about to land at Isla Poi AFB in 1932. (*Gonzalo Palau*)

serials 5, 6 and 23 (ex 3), the last ones crewed by Captain PAM José Atilio Migone, Second Lieutenant PAM Walter Gwynn and Captain PAM Leandro Aponte respectively.

The Paraguayan Air Arm's first combat mission

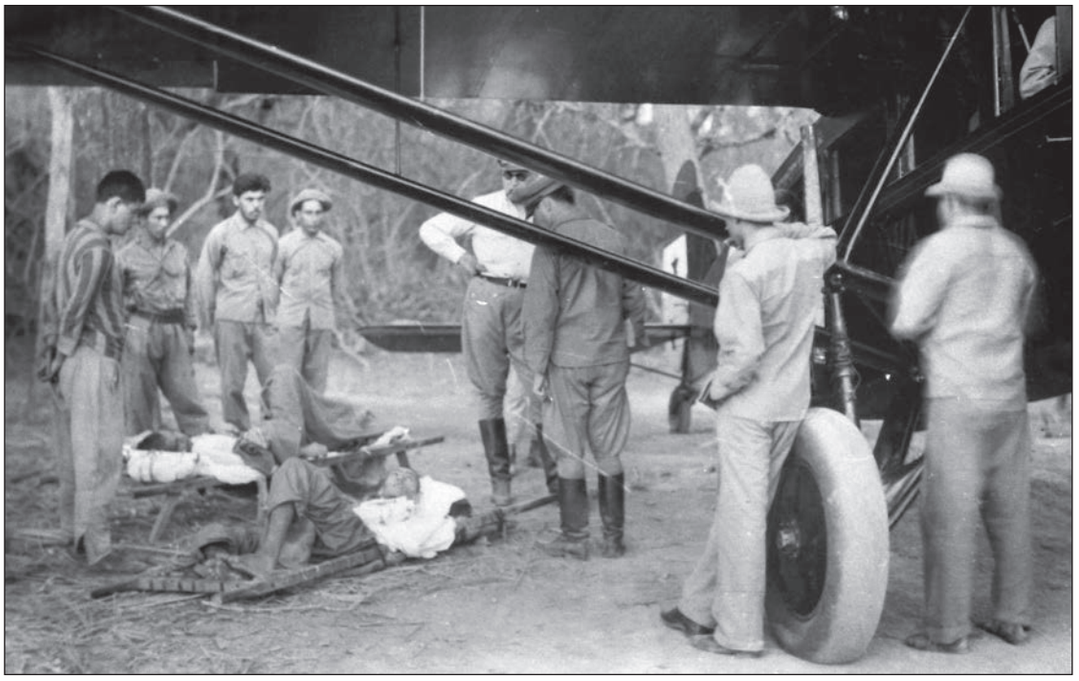
The first operational mission took place on 17 August when *Potez 25A.2* serials 4, 5 and 6, crewed by first lieutenants PAM Atilio Ibáñez Rojas and Trifón Benitez Vera and Second Lieutenant PAM Carmelo Peralta, together with first lieutenants PAM Roman Garcia and Emilio Rocholl and Second Lieutenant PAM Isidoro Jara as gunners, took off from *Isla Taguató AFB* to bomb the Bolivian positions in the *Carayá* zone. The mission was a success and there were neither Bolivian aircraft nor AA fire in the area. Two days later, *Fort Carayá* fell into Paraguayan hands.

Bolivian air raid on Boquerón

On 31 July 1932, Vickers Vespa serial 6, crewed by Major Jordan, escorted by Scouts 12 and 7 piloted by Captain Coello and Lieutenant Paravicini, strafed and bombed Paraguayan troop concentrations near *Fort Boquerón*, causing a lot of casualties. Since all the aircraft flew at a very low altitude, they received a lot of bullet impacts from the ground but managed to return to their base, where they were repaired by the ground crews. The commander of the Combat Air Group at *Muñoz AFB* was Major Jorge Jordán and it had reconnaissance and fighter squadrons. On 8 September, a Scout crewed by Captain Luis Ernst Rivera on a

Potez 25A.2 serial 5 during the first months of the war. (*Instituto de Historia y Museo Militar del MDN*)

First Lieutenant PAM Emilio Rocholl (left) was wounded by Major Jorge Jordan (right) during the first dogfight in the war. (*Carlos A. Pusineri Scala*)



A pair of wounded soldiers about to be evacuated on *Travel Air S6000B* serial T-9 at *Isla Poi AFB* in 1933. (*Instituto de Historia y Museo Militar del MDN*)

recce flight near *Boquerón* saw a huge Paraguayan Army corps advancing towards *Fort Boquerón* and decided to strafe it, causing some casualties.

During the first months of the war, the Bolivians took the initiative and captured some Paraguayan forts: *Huijay* on 4 August, supported by *Vespas* and *Scouts*, which bombed and strafed the enemy, and a month later, on 6 September, the *Rojas Silva* garrison.

First air combat

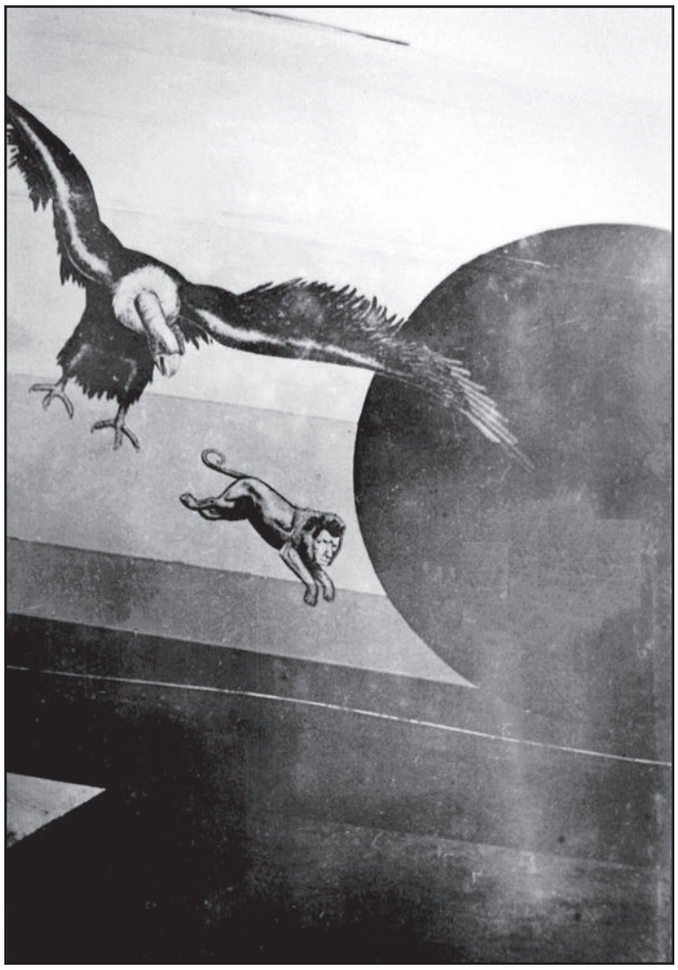
The first dogfight in the Chaco War took place on 9 September 1932 when the Battle of *Boquerón* started. The Bolivian *Vickers Vespa* serial 6, crewed by lieutenants Paravicini and Garcia, and two Vickers Scouts, serial 7 with Major Jorge Jordán and serial 8 with Captain Luis Ernst Rivera, attacked the Paraguayan *Potez 25A.2s* serials 5 and 6, which were bombing the Bolivian positions in *Fort Boquerón*. *Potez 5* was crewed by first lieutenants PAM Emilio Rocholl and Roman Garcia as the gunner, and *Potez 6* by first lieutenants PAM Trifón Benitez Vera and Carmelo Peralta, all of them pilots. At the beginning of the war, the *Potez* bombers were crewed by two pilots with the idea that if one of them was severely injured or killed, the other could take control of the aircraft, but this was later prohibited by General Estigarribia; he said that the Paraguayan Army could not afford the loss of two pilots if a bomber was shot down. After releasing all the bombs, both *Potez 25*s initiated evasive manoeuvres to return to their base; shots from Scout Nr.7 severely wounded First Lieutenant PAM Emilio Rocholl who started bleeding profusely and could barely control his aircraft; First Lieutenant PAM Román Garcia took control of the plane while *Potez 6* flew in formation to defend Rocholl and Garcia. Inexplicably, Major Jordán returned to his base, maybe short on fuel, but the Vespa and the other Scout continued attacking both *Potez*, which were then flying at tree-top level at a very low speed. After a few minutes, both Bolivian planes also withdrew and the Paraguayan bombers could reach their base at *Isla Taguató*. First Lieutenant PAM Rocholl was immediately taken to the hospital at *Isla Poi* base on board one of the *Potez* for medical attention. On the following day, he was evacuated on a transport plane to the capital for surgery, being the first medevac mission carried out by the *Transport Squadron*. The ground crews were surprised to find numerous bullet impacts on both *Potez*, but none of them affected vital parts. The bombers were patched and were ready to continue fighting.

In one recce mission carried out by *Potez 25 A.2* serial 1 over *Boquerón*, escorted by *Wibault 73* serial 1 flown by First Lieutenant PAM Gregorio Morinigo, and serial 2 crewed by Second Lieutenant PAM Luis Escario, both fighters had radiator problems and had to crash land: the first one near *Pozo Valencia* and the second near *Boquerón* itself. Unfortunately, they were both damaged beyond repair but the pilots survived.

During the rest of the Battle of *Boquerón*, which fell into Paraguayan hands on 29 September, there were no more dogfights, although both military aviations were very active bombing and strafing the enemy troops on different days. During the 20 days of this battle, the *Potez 25* bombers escorted by *Wibault 73* fighters performed 12 bombing and 15 recce missions and adjustment of artillery fire. The Bolivians did the same with *Breguet XIX* and *Vickers Vespa* bombers, escorted by *Scout* fighters. During the tight siege, the Bolivian Military Aviation tried to supply the beleaguered troops by throwing ammo and food sacks from the air, but most of them fell into Paraguayan hands or were damaged.

Bolivia captures *Fort Bogado*

On 14 September 1932, *Vickers Scout* serial 96, crewed by Captain Rafael Pabón, and a *Vickers Vespa* piloted by lieutenants Rivera and Ardiles flew from *Ingavi* southwards to *Florida*, which Paraguayan troops were about to attack. They immediately informed the commander about the situation and on the following day, all the aircraft were used to strafe and bomb the enemy, preventing the imminent attack, and allowing the Bolivians to occupy the Paraguayan garrison of *Bogado.*



Aircraft art was rare in the Chaco War. *Scout* serial 54 had a Bolivian condor chasing a Guaraní lion painted on the fuselage at the beginning of the war. The true fact was that the lion finally chased the condor out of the Chaco at the end of the conflict. (*Ramiro Molina Alanes*)

Not a happy landing for *Potez 25 A.2* serial 4 at Ñu-Guazú AFB. It was repaired and went back to the battlefront. Note the alternative roundel painted on the wings. The pilot in the flying suit is First Lieutenant PAM Tomás Ruffinelli (centre) with Second Lieutenant HC Benito Sánchez Leyton and Second Lieutenant Obs. Aer. Estanislao Arce (first on the right). (*Archivo del Instituto de Historia y Museo Militar del MDN*)

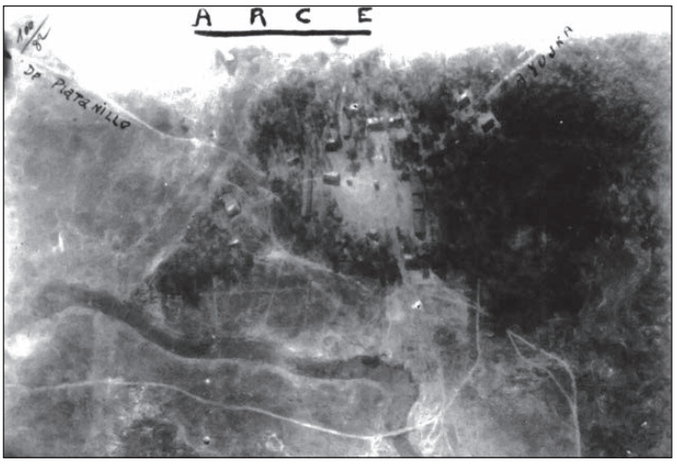


Photo taken from a *Potez 25* during a recce mission over *Arce.* (*Instituto de Historia y Museo Militar del MDN*)

Second air combat

After the fall of Boquerón, the next target was to capture the Bolivian *Fort Arce*. On 5 October 1932, a couple of *Potez 25* bombers hit the stronghold for the first time, causing a lot of casualties. On the following day, *Potez Nr.3*, crewed by first lieutenants PAM Tomas Ruffinelli and Roman Garcia, and *Potez 4* with first lieutenants PAM Carmelo Peralta and Isidoro Jara, were bombing the Bolivian positions at *Arce* when they were attacked by a solitary *Breguet XIX* crewed by lieutenants Arturo Valle and Garcia. Even though it was a surprise attack, the *Potez* bombers could release their entire bomb load on *Arce,* both gunners shooting wildly at the Bolivian Breguet. After shooting at each other without success, the Breguet pilot decided to return to its base at *Muñoz* and the Paraguayan planes did the same to *Isla Poi*.

From left to right: Paraguayan Air Arm First Lieutenant PAM Tomas Ruffinelli, First Lieutenant PAM Isidoro Jara, Second Lieutenant PAM Abdón Alvarez Albert, Second Lieutenant PAM Abdón Caballero Alvarez and Second Lieutenant PAM Enrique Déntice. (*Instituto de Historia y Museo Militar del MDN*)

Third air combat

On 10 October, *Wibault 73* fighters flew a recce mission over the Bolivian forts of *Yucra* and *Cabo Castillo*, during the offensive of the Paraguayan Army against *Arce*. Three days after that, *Potez 25 TOE* serial 7, a brand new bomber, saw action for the first time, crewed by First Lieutenant PAM Tomas Ruffinelli and Second Lieutenant Obs. Aer. Gonzalo Palau. They were on a photo-recce mission over *Arce* when their plane was attacked by a *Vickers Vespa* piloted by Lieutenant Colonel Alfredo Santalla and Major Vazquez as the gunner. Both aircraft spat fire at each other without causing great damage, and after 20 minutes, each of them returned to their bases.

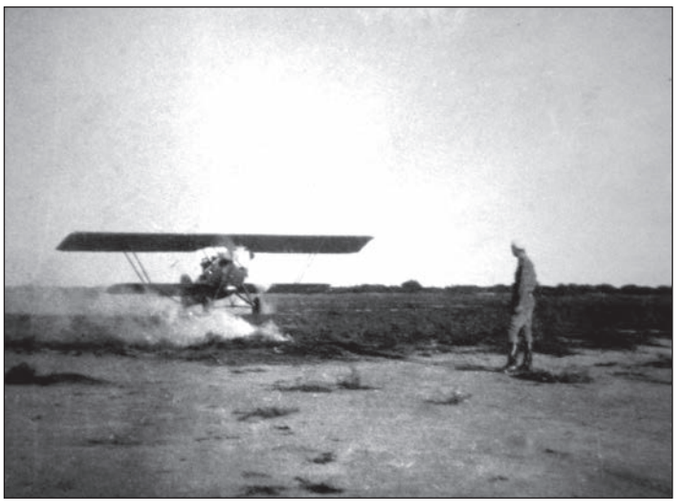
Arce was again hit by a couple of *Potez 25* bombers after a few days, causing 300 casualties. The pictures taken by Second Lieutenant Palau were so accurate that the final assault on the fortress was carefully planned and it took place on 23 October; it was the second Bolivian fortress that fell into Paraguayan hands in less than a month. *Arce* was later baptised as *Fort Gaspar Rodriguez de Francia*, a Paraguayan independence hero. It was then that Major PAM José Atilio Migone was appointed as the battlefront commander of the Paraguayan Air Arm.

On 26 October, a couple of *Potez* bombers escorted by Wibault fighters attacked *Alihuatá*, destroying fuel and ammo depots, without being bothered by the Bolivian aviation. A month later, *Potez Nr. 7*, crewed by First Lieutenant PAM Tomas Ruffinelli and Second Lieutenant PAM Roman Garcia, on a mission to adjust the artillery fire on the *Saavedra* area, was attacked by the Bolivian AA *Semag-Becker* guns, but they could return to their base with only minor damage. The artillery destroyed the advanced positions of the Bolivian Army, so the Paraguayan troops could continue on the offensive.

Right after the occupation of Arce, three *Potez* bombers were detached there. A few days later, a solitary Vespa, crewed by Sub-Lieutenant José Arzabe Bazoberry and NCO Montaño, bombed the fort trying to destroy the aircraft unsuccessfully. Arzabe was wounded in the thigh by ground fire and lost a lot of blood, but could control the aircraft and returned to his base. Once on the ground, he fainted and had to be taken out of the cockpit by the ground crews. The Vespa had 34 bullet impacts in the wings and fuselage.

Fourth air combat

On 10 November 1932, Bolivian Vespa bombers escorted by Scout fighters attacked the Paraguayan positions in *"Kilómetro 7"* near the fort of *Saavedra.* In the first days of December during the battle of *Saavedra*, all the available *Potez* bombers were used in several bombing and recce missions over the area. On one of such missions, on 3 December, *Potez 7* with first lieutenants PAM Ruffinelli and Benitez Vera was attacked by a Scout piloted by Lieutenant Juan Antonio Rivera, and a Vespa crewed by Lieutenant Alfredo Pascoe and Colonel Quintela. The slow *Potez* took evasive action immediately by flying at tree-top level in zigzag and almost at stall speed. The Scout shot a few rounds at the *Potez* without damaging it and Benitez Vera kept shooting his twin *Madsen* machine guns until both Bolivian planes returned to their base.

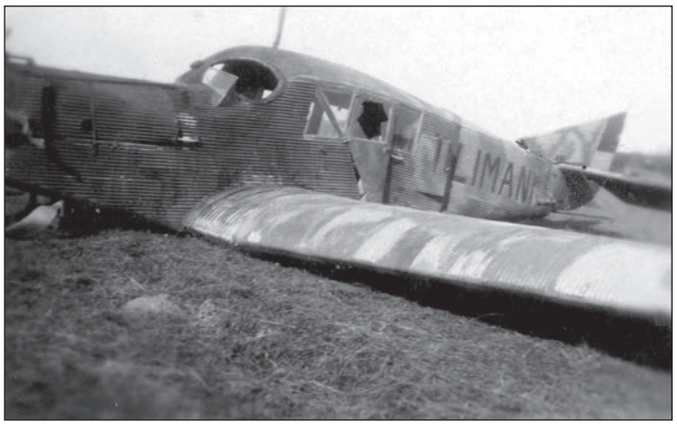


A *Potez 25* bomber taxiing at *Isla Poi AFB* in 1933. (*Instituto de Historia y Museo Militar del MDN*)

Fifth air combat

On 4 December, *Potez 25A.2* Nr. 6, crewed by First Lieutenant PAM Trifón Benitez Vera and Captain Obs. Aer. Ramón Avalos Sánchez, chief of operations of the Paraguayan Army staff, took off from Isla Poi AFB for a solitary recce mission over *Saavedra*. The plan was to get data for the final offensive to conquer the fort. The flight was uneventful until they reached *Saavedra* and after a few minutes, the *Potez* was attacked from above by a Scout fighter crewed by the then Captain Rafael Pabón. Captain Ávalos Sánchez could fire his Madsen while the pilot Benitez Vera took evasive action. In the second attack, Pabón approached from below the bomber, first hitting the fuel tank and then fatally wounding Captain Avalos; without rear protection, the chances for the *Potez*

First Lieutenant PAM Trifón Benítez Vera (left), the first Paraguayan pilot to be shot down in combat, and Captain Rafael Pabón of the Bolivian Military Aviation. (*Diario Ultima Hora*)



Junkers F.13 "Illimani" after a belly landing in the Bolivian orient. It was later repaired and returned to service. Note the tactic cammo applied. (*Fuerza Aérea Boliviana*)

were minimal and after a few rounds, the pilot was also killed. The doomed *Potez* crashed behind the Bolivian lines, southeast of *Saavedra*, and the bodies of the unfortunate crew were recovered by the enemy. According to Bolivian sources, a solemn funeral was planned at *Muñoz AFB* and even Captain Pabón, who gave the following speech, attended the ceremony:

> … Knights of the Air, victims of your own heroism, courageous of your people, you died in a noble and courageous battle. Fate made me your winner, but before death, there are no winners or losers. Your remains will rest on Bolivian soil with the respect and admiration of your fellow countrymen.

This was Pabón's only confirmed aerial victory. The other two or three *"kills"* assigned to him were easily revoked by comparing Bolivian and Paraguayan official data in serious research done decades after the end of hostilities. Bolivia has kept *Potez 6*'s rudder, the broken propeller and a few of the crew's belongings as trophies, which have been exhibited at the military school in La Paz since 1932.

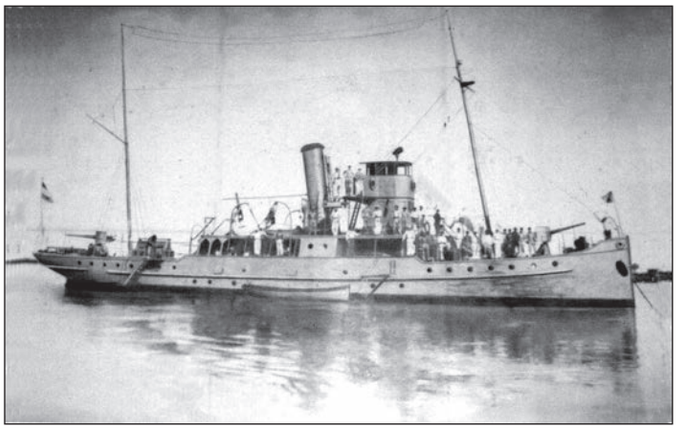
Right after the fifth air combat, there were no others until mid-1933, but both military aviations were very active in recce and bombing missions on all fronts. In the first month of that year, the Wibault fighters were finally replaced by the newly acquired *Fiat C.R.20bis* of the *Eleventh Fighter Squadron*, which was called *"The Indians"*. The *Potez 25* bombers were kept in service until the end of the war since they could not be replaced. On the Bolivian side, the new Curtiss *Osprey*, Hawk and Falcon replaced the Vickers Vespa, Scout and *Breguet XIX*.

Raids over *Saavedra* and *Muñoz*

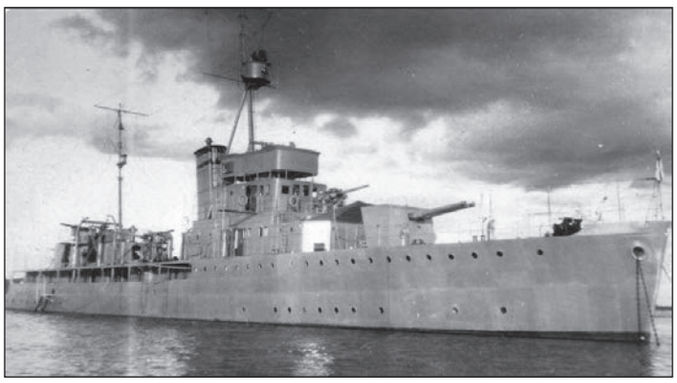
During November and December, *Potez 25* serials 3 and 4 escorted by *Wibault 73* serials 5 and 7 attacked the Bolivian positions in *Saavedra* and *Muñoz* several times without being bothered by enemy fighters. On one occasion, both *Wibault* strafed some *Vespa* and *Scout* aircraft, and even a *Junkers F-13* on the ground, which were deployed at *Muñoz AFB* and could not take off because of the extent of the damage caused by the Paraguayan fighters.

Bahía Negra aero naval battle

On 22 December 1932, three Bolivian *Vickers Vespa* bombers attacked the port of *Bahía Negra*. The original intention was to destroy the Paraguayan Navy gunboats that were normally docked



The Paraguayan Navy gunboat *Tacuary*. (*Archivo de la Armada Nacional*)



The Paraguayan Navy gunboat *Humaita*. (*Archivo de la Armada Nacional*)

there. On that day, the gunboat *Tacuary*, the oldest one in the fleet, was getting ready to set sail to Asunción when the Vespas arrived and began strafing and bombing. The crew on board the Tacuary fired with the only AA defence available: a pair of old Maxim machine guns. The Vespas could not get a direct hit on the gunboat and one of them was damaged by the AA fire; members of the ship's crew reported seeing one of the Vespa flying inland with a trail of black smoke coming out of its engine. The other two Vespas dropped more bombs on the port, one of them instantly killing the commander of the north front, Colonel José Julian Sánchez. There were also a few wounded soldiers and civilians. The Vespas still had some more bombs to drop when their crew saw another gunboat approaching the area, the *Humaitá,* and decided to attack the new target. Unfortunately for them, the Humaitá

Two Paraguayan Navy officers who flew in the Air Arm. (*Instituto de Historia y Museo Militar del MDN*)

Potez 25TOE serial 7. (*Instituto de Historia y Museo Militar del MDN*)

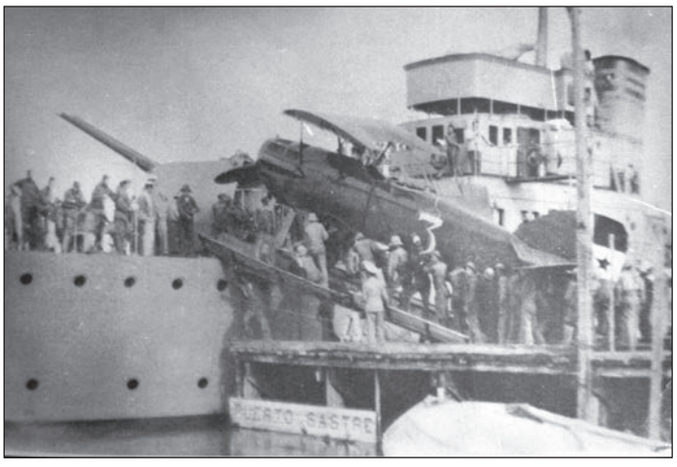
had a formidable AA defence and when the Vespas got closer, the crew on board fired their three 76mm *Vickers-Terni* AA guns and their two 40mm *Maxim* machine guns. The Vespas released a few bombs that fell nearby, causing no damage to the Humaitá, and flew away. A few days after that, the Paraguayan Naval Aviation *CANT 10ter* hydroplane piloted by navy First Lieutenant PAN Ramón Martino transported the new commander of the north front to Bahía Negra, navy Captain Elías Ayala.

Meanwhile, eight more *Potez 25* bombers were received by the military aviation. They were in fact the *Potez 25TOE* version, which had bigger fuel tanks to increase range. They came directly from France in wooden crates and were soon taken to Ñu-Guazú AFB to be assembled and tested. With these aircraft, the *Second Reconnaissance and Fighter Squadron* was formed and once they were ready, they were all sent to the battlefront. All the remaining *Potez 25A.2* in service, which at that time were only three machines, serials 3, 4 and 5, were flown to the capital for extensive maintenance.

The *Nanawa* air bridge

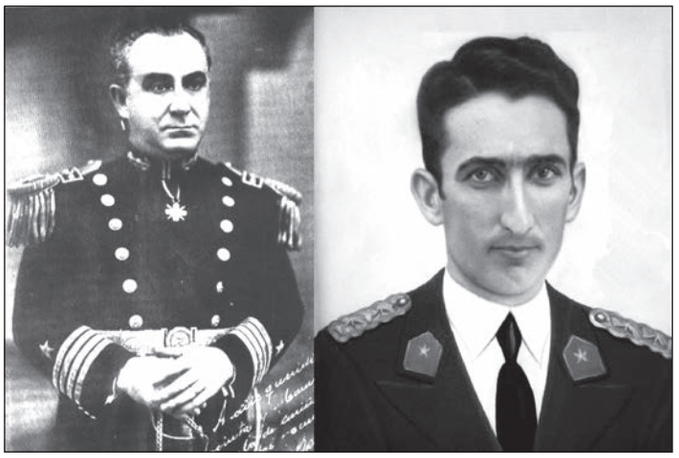
The following battle took place in *Nanawa*, which was an important Paraguayan Army stronghold. General Kundt, commander of the Bolivian Army, wanted to capture it for his personal prestige, since *"his army"* had lost almost all its previous battles. He realised that *Nanawa* could not be conquered with frontal infantry attacks since it was very well defended, so he decided to encircle it. The Bolivians cut all the communication roads, so getting supplies to the Paraguayan troops was almost impossible. The new *Curtiss Osprey* bombers and *Hawk* fighters attacked the fortress repeatedly, causing a lot of casualties. On 20 January 1933, each Paraguayan soldier had only five bullets left, half-a-litre of water and almost no food; the Paraguayan Army staff decided to carry out an air bridge to take ammo and water to the troops in Nanawa; fortunately, the fortress runway was still in Paraguayan hands. Four *Potez 25* bombers, serials 3, 4, 5 and 7, had all bomb racks and machine guns removed, except the one for the pilot, and ammo and water containers were carried in the rear cockpit, 100 kilos per flight. They all took off from *Isla Poi AFB* early in the morning and landed at *Nanawa* under enemy fire; the pilots did not shut off the engines and once the sacks were unloaded, they took off again to pick up more and return. The heroic crews were First Lieutenant PAM Isidoro Jara (*Potez 3*), First Lieutenant PAM Carmelo Peralta (*Potez 4*), First Lieutenant PAM Atilio Ibañez Rojas (*Potez 5*) and First Lieutenants PAM Walter Gwynn, Roman Garcia and Tomás Ruffinelli (*Potez 7*). They flew without the protection of their rear gunners but the Bolivian aviation was absent during those crucial days. The air bridge started on 22 January and lasted until 25 January, carrying a total of 1,610 kilos of ammunition. Three of the *Potez* were damaged by enemy fire during the operation, and

The *Casado* tannin factory railroad, which proved to be an important logistics aid for the Paraguayan Military Aviation during the war, transporting aircraft for maintenance, ammo, bombs, spare parts, engines and personnel. (*Instituto de Historia y Museo Militar del MDN*)



Potez 25A.2 serial 3 being loaded aboard a Paraguayan Navy gunboat at *Puerto Sastre* after the Battle of Nanawa in January 1933. (*Instituto de Historia y Museo Militar del MDN*)

Paraguayan troops inspecting the remains of the *Curtiss-Wright Osprey* shot down near Toledo. (*Alas de Bolivia* by Amalia Villa de la Tapia and *Instituto de Historia y Museo Militar del MDN*)



Lieutenant Commander PAN José Bozzano, the Paraguayan Air Arm director (left) and Major José Atilio Migone, battlefield commander (right). (*Instituto de Historia y Museo Militar del MDN*)

they had to be kept there until the battle finished. The Paraguayan troops stationed in *Nanawa* broke the siege, and even pursued the enemy out of the area, with the help of another army corps that reached the area for reinforcement. After the battle, the recovery of three damaged *Potez* bombers was a huge operation for the maintenance crews, since each one of them was crucial for the Air Arm. They were removed in parts using trucks, from *Nanawa* to the *Punta Rieles* train station of the Casado railroad; from there, using the train, to Port Casado where the aircraft were transferred to several ships, including the gunboats, taken to Asunción, transferred again to the central railroad service and taken to Ñu-Guazu AFB where they were finally repaired. After a few months, they all returned to the battlefront.

Meanwhile, Major Rafael Pabón was appointed as director of the Military Aviation School in Villamontes.

The second Bolivian plane shot down

On 25 February 1933, a brand new *Curtiss-Wright Osprey*, crewed by Captain Arturo Valle and Lieutenant José Max Ardiles, on a recce mission over the Paraguayan positions in the *Fort Toledo* area, was shot down by AA-machine guns; both crew members were killed. Their bodies were buried in the *Toledo* cemetery in a solemn ceremony, as it was done for the Paraguayan aviators shot down some months before in *Saavedra.* During the ceremony, a couple of *Scout* fighters overflew the area and in one moment, one of them threw a crown of flowers over the coffins; no one tried to shoot at them. The Paraguayan troops defended the area fiercely and the enemy had to withdraw with more than 2,000 casualties. In Bolivia, as a posthumous tribute, one of the *Caudron C.97* trainers received the name of "*Capitan Valle*".

Right after the Battle of *Toledo*, a new promotion of Bolivian pilots graduated from the *Military School of Aviation*, including captains Claudio Moreno and Alfredo Pacheco, Lieutenant Claudio López, and sub-lieutenants Alberto Paz Soldán, Luis Paredes, Jorge Eulart, Armando Suárez, Jorge Diez de Medina, Mario Calvo, René Dorado, Alfonso Sáenz and Carlos Aparicio.

Some accidents and a new commander

On 8 March, Lieutenant Commander PAN José Bozzano was appointed as the general director of the Military Aviation School, replacing Almonacid, who returned to Argentina. Bozzano was also the director of the navy arsenal. He had studied naval engineering at the *MIT* in the US and was also trained as a naval aviator in the US Navy in the 1920s. He later designed the blueprints of the twin gunboats *Paraguay* and *Humaitá*, which were built in Italy. Some days later, a Vespa crewed by lieutenants Fabián Monasterios and Ricardo Rocha carried out a recce mission over the Paraguayan positions in *Campo Jordan*. After strafing the enemy troops, Lieutenant Monasterios was seriously wounded in the face and fainted, so Lieutenant Rocha took control of the plane and flew back to Saavedra where he could land safely. Monasterios was taken to the military hospital and survived.

Meanwhile, *Potez 25*s conducted some recce missions over *Forts Francia-Herrera-Platanillos* because of some enemy troop movements. At the end of March, Bolivian Vespas bombed *Isla Poi AFB* to destroy the *Potez* fleet stationed there, but they were appropriately hidden in their special shelters in the woods nearby. The bombs damaged the air strip, the commander's office and also the hospital, but they were soon repaired.

On 7 April, the Paraguayan Air Arm *Junkers A.50fe Junior* serial T-3 crashed in a fatal accident at Ñu-Guazú *AFB*, killing the NCO MAM Otto Lauber who was in the front cockpit; the pilot, Second Lieutenant PAM Arsenio Vaesken, was unscathed. On the same date, the *Comanchaco* (Chaco commander) issued Report Nr. 153 that informed the population of the successful bombing missions over the Bolivian positions in *Platanillos-Herrera* road, between the forts of *Gondra* and *Tte. Zenteno.*

May was not a good month for the Paraguayan aviation because of two accidents. On 5 May, *CANT 26* serial T-6, crewed by Captain PAM José D. Jara and Second Lieutenant MAM Niemann, crashed between *Concepción* and *Orihuela* in the Chaco, killing both. Some days after that, the *Savoia S.52* fighter, serial 16, was heavily damaged at Ñu-Guazú AFB but his pilot, First Lieutenant PAM Emilio Rocholl, received only minor injuries.

On 25 May, the five *Fiat C.R.20bis* of the *Eleventh Fighter Squadron* were ready and departed to the Isla Poi AFB, with a previous technical stop in the city of *Concepción*. On the ferry flight, the Fiat crewed by First Lieutenant PAM Walter Gwynn had to crash-land because of technical problems, with a total loss. Gwynn survived the accident and his commander wanted to send him back to Asunción for a medical check but he refused, asking to be sent to *Isla Poí AFB* to fight. Because of his last name, he was considered a mercenary pilot for Bolivians, but in fact he was born in the city of *Horqueta*, near *Concepción*, Paraguay from an American father and a Paraguayan mother.

The Bolivian air raids on *Alihuatá*, Port Pinasco and *Port Casado*

On 13 March 1933, Bolivian troops captured *Fort Alihuatá*. During those days, seven *Curtiss Osprey* fighter-bombers, crewed by Lieutenant Colonel Jordan, captains Ernst, Nery, Moreno, Garcia and Rojas, lieutenants Arzabe, Rivera, Rocha and Monasterios, sub-lieutenants Beltrán and Montaño and NCOs Sainz and Urdinimea, carried out recce missions in the area, bombing and strafing Paraguayan troop concentrations.

On 11 April, *Ospreys* bombed *Port Pinasco* without causing a lot of damage. Some days later, they did the same on *Port Casado* where the port facilities were severely damaged. They also bombed the *Casado* railways with some 25 bombs, partially destroying the rail tracks, which were soon repaired. The Argentinean government protested immediately since the *Port Casado* factory was an Argentinean company and sent an ultimatum to the Bolivians, which was effective enough since neither the port nor the train were ever attacked again. It was at that time that a single *Osprey* crewed by Captain José Coello flew over the Paraguayan city of *Concepción* to drop some propaganda leaflets without being bothered by the Paraguayan aviation.

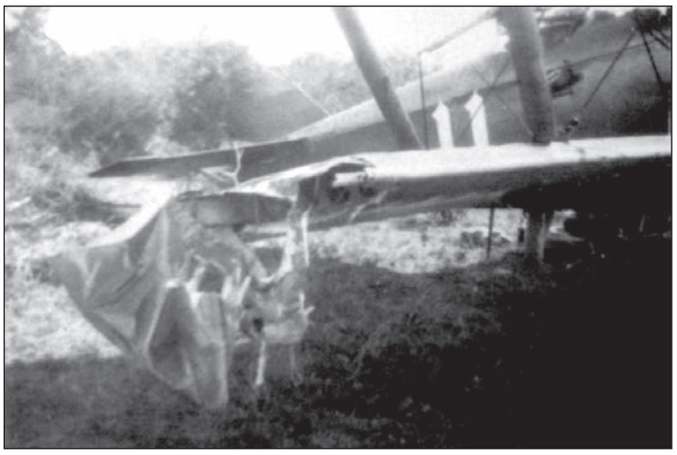
Bombing raids over *Platanillos*

On 24 May, five *Potez 25* bombers, serials 10, 11, 12, 13 and 14, bombed the Bolivian positions in *Platanillos* successfully. No Bolivian aircraft were present but the AA fire was intensive, damaging the lower wing of *Potez 11*. All the aircraft, after dropping 85 bombs, returned to their base. On 3 June, six *Potez 25TOE* bombers, serials 9, 10, 11, 12, 13 and 14, escorted by two *Fiat C.R.20bis* fighters, serials 11-1 and 11-3, once again bombed Platanillos. More than 1,200 kilos of bombs were dropped in the area, destroying trucks, artillery ordnance, and an ammo and fuel depot, causing a lot of casualties.

The Bolivians were completely taken by surprise and their fighters did not come to the rescue. All the attacking aircraft returned to their base at Isla Poi; the *Potez* bombers started landing and the last one was serial 14, crewed by navy First Lieutenant PAM Teófilo Fariña Sánchez as the pilot and Second Lieutenant Obs. Aer. Estanislao Arce as the gunner. They did not notice that two bombs were still partially hung in their racks under the lower wing, apparently failing to be released during the mission. The ground crew noticed the unreleased bombs and desperately tried to call the *Potez 14* crew's attention; the bomber landed heavily and as soon as the wheels touched the ground, both bombs were released and exploded; the expansive wave of the detonation lifted the plane and then it crashed in flames on the air strip; although Second Lieutenant Arce was seriously wounded, he could leave his cockpit quickly, but First Lieutenant Fariña Sánchez had a leg trapped between the cockpit instrument panel and the seat and was struggling to release it. Before the fire could engulf the plane, ground crews took Fariña Sánchez out of his cockpit, saving his life. That brave naval officer could not fly again because one of his legs had to be amputated. He received prosthesis and continued his military career in the navy until he retired with the rank of captain in the 1960s.

Sixth air combat

On 11 June 1933, three *Fiat C.R.20bis* fighters escorted the same number of *Potez 25*s on a bombing mission over the Bolivian retreating troops in the *Platanillos* zone. Just a few minutes after landing at Isla Poi AFB, the Fiat pilots still in their cockpits, the alarm of an imminent air attack was issued, so the fighters were soon refuelled and took off. They were serials 11-1 piloted by Captain PAM Bernardino Caballero Alvarez, the *Eleventh Fighter Squadron commander*, 11-3 by First Lieutenant PAM Román Garcia and 11-5 by Captain HC Vladimir Porfenenko, a First World War veteran White Russian volunteer. They levelled off at 3,000 feet and having the sun behind them, dived towards the four attacking Curtiss *Osprey*. At that time, Bolivian aviators did not know that Paraguay had new fighters, so they were taken by surprise. The Fiat could break the *Ospreys*' tight formation, which just released all the bombs at random to engage combat. The Fiats were a lot more manoeuverable than the *Ospreys*, although the latter were faster. It



Potez 25TOE serial 11 lower right wing after being hit by AA fire during one raid over *Platanillos* in May 1933. It was soon repaired and returned to action in June. (*Victor Meden*)

The *Potez 14* crew for the *Platanillos* bombing mission. (*Instituto de Historia y Museo Militar del MDN*)

Some *Eleventh Fighter Squadron* pilots and mechanics with a *Fiat C.R.20bis* at Ñu-Guazú AFB in 1933. (*Tito Aranda*)

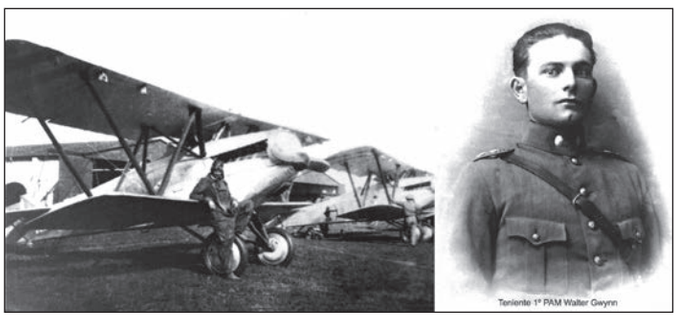
The Paraguayan Air Arm *"early warning system"* at Isla Poi AFB. (*Instituto de Historia y Museo Militar del MDN*)

seemed that the Bolivian pilots could not overcome the surprise attack and flew away with their aircraft full of bullet holes.

Seventh air combat

By then the Bolivian Military Aviation was well aware of the Paraguayan new fighters and decided to carry out a raid to destroy them on the ground. On 12 June, they launched a massive attack using five *Curtiss Osprey*, three *Curtiss Hawk* and a single *Vickers Scout*, which rapidly flew to *Isla Poi AFB*. The Paraguayan Air Arm had organised an early warning system for imminent air attacks consisting of a watchtower built on top of a strong tree, with two or three sentinels with binoculars. Once they saw planes at a distance, they fired a gun so the pilots could take off immediately. This was the case on that day, so three Fiat got into the air, 11-1 crewed by First Lieutenant PAM Walter Gwynn, 11-3 by First Lieutenant PAM Tomás Ruffinelli and 11-5 by First Lieutenant PAM Román Garcia, using the same tactics of the previous day. They climbed to 8,000 feet and dived towards the attackers, dispersing them. Meanwhile, the ground crews moved all the *Potez* bombers to their shelters.

The Fiat first attacked the *Ospreys*, which again released their bomb load and inexplicably flew away, maybe giving the engagement *"honour"* to the Hawk and the Scout, which did attack the Paraguayan fighters. First Lieutenant PAM Ruffinelli could attack one of the *Hawks*, which received a lot of impacts but without damaging its engine, and it quickly left the area. The Scout, piloted by Major Luis Ernst, chased First Lieutenant Walter Gwynn's Fiat. Gwynn had had a previous accident in the Fiat 11-9 in the ferry flight to the Chaco and crash-landed in Concepción,



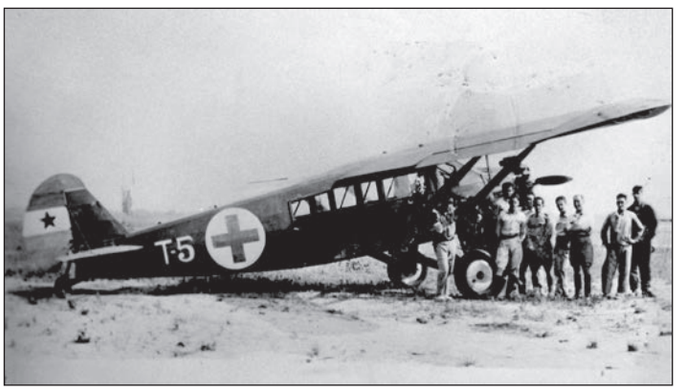
First Lieutenant PAM Walter Gwynn with a couple of *Fiat C.R.20bis* fighters at Ñu-Guazú *AFB* in May 1933. (*Instituto de Historia y Museo Militar del MDN*)

and he was not in optimal health conditions. It is believed that his body did not endure the G-forces during the evasive manoeuvres in the dogfight and fainted, with the subsequent crash. The autopsy of his body did not reveal any bullet wounds and the remains of his fighter did not have any bullet impacts either in the engine or the fuel tank. Of course, the Bolivians have always considered this a legitimate aerial kill for Ernst. After this accident, the attacking Hawk and Scout left the area and the remaining Fiat landed at Isla Poi AFB safely.

Relevant aerial missions between July 1933 and April 1934

There were no more air combats for the rest of 1933. The *Potez 25s*, escorted by the Fiat fighters, continued bombing the Bolivian positions all over the battlefront in complete impunity, without

An impressive flight line of Bolivian *Curtiss Osprey* at *Muñoz AFB* in 1933. (*Ramiro Molina Alanes*)



Travel Air S6000B serial T-5 (later T-9) named *"Nanawa"* at *Isla Poi AFB* in 1933. (*Instituto de Historia y Museo Militar del MDN*)

Bolivian fighter pilots: left to right, Lieutenant José Arzabe, Lieutenant Jesús Mérida, Lieutenant Luis Paravicini, Lieutenant Alfredo Pascoe, Lieutenant Luís García, Major Jorge Jordán, Lieutenant Eliodoro Nery, Captain Luis Ernst, Lieutenant Alberto Montaño, Lieutenant Alberto Alarcón, Lieutenant Emilio Beltrán and Lieutenant Luis Soria. (*Revista Aeronáutica* – Fuerza Aérea Boliviana)

Some Paraguayan Air Arm pilots relaxing at Ñu-Guazú AFB before being transferred to the battlefront in 1934. In the back are a *Travel Air S6000B* and a *Fiat C.R.20bis*. (*Tito Aranda*)

being bothered by the enemy fighters. The Bolivian Army staff did not believe very much in the tactical and strategic use of the military aviation; they still thought of it just as an auxiliary arm. There were many instances when reports submitted by their Air Arm were not taking into account to plan actions against the enemy. On the other hand, the Paraguayan Army staff gave great importance to their Air Arm; General Estigarribia, the commander-in-chief, used to say that the military aviation was the *"eyes"* of the army in the sky.

During the second battle of *Nanawa*, on July 1933, the fort was massively attacked by Bolivian infantry troops with flamethrowers, aircraft, artillery and even tanks. The Bolivians had decided to capture this fort and the siege was so tight that soon the air strip fell into their hands. The air bridge operations could not be repeated, so a new strategy had to be carried out. Since the *Potez* could not land there with much-needed ammo and hand grenades, it was decided to launch it using bags with parachutes. Two *Potez* bombers, crewed by Captain PAM Victor Vallejos and Major PAM Leandro Aponte, carried out this mission successfully. Once again, the Paraguayan troops could break the siege and pursue the enemy troops.

In August, the Paraguayan Air Arm started using both *Travel Air S6000B* transport planes in medevac missions all over the front. Many soldiers had their lives saved because of these venerable planes. It was at that time that *Potez 25TOE* serials 12 and 13, escorted by three *Fiat C.R.20bis* fighters, carried out a recce mission over the Bolivian positions at *Falcón, Gondra* and *Pirizal.*

On 11 September 1933, the Paraguayan First Army Corps attacked the Bolivian positions in *Pampa Grande* and *Pozo Favorito*, taking 1,000 prisoners and a vast number of weapons and ammunition. On 27 September, some *Potez 25*s bombed the Bolivian positions on the *Nanawa-Pirizal* road. At the same time, the Paraguayan Naval Aviation performed several bombing missions in the north front, over the Bolivian forts of *Vargas, Vitriones* and *Vanguardia,* using its *Macchi M-18A.R.* flying boats. Each Macchi could carry about 120 kilos of bombs.

Five Bolivian Curtiss *Ospreys* bombed and strafed *Nanawa* on 11 November to destroy the *Potez 25TOE* bombers deployed there. As soon as the attack started, Second Lieutenant MAM Agustín Pasmor, maintenance chief of the Paraguayan Air Arm, took the initiative to move the bombers out of the air strip with the help of some NCOs and soldiers while bombs were exploding nearby. Fortunately, they could take the *Potez* to their shelters and were not destroyed by the enemy aviation. This heroic action saw Pasmor and his crew receive a War Citation.

In early December, Paraguayan troops conquered *Alihuatá*. On 11 December, 8,000 Bolivian troops and 250 officers were taken as prisoners at *Campo Via* as well as an immense quantity of weapons and ammunition, including 24 cannons, 60 mortars, 1,000 machine guns, 11,000 rifles, 2.5 million bullets and 80 precious trucks. The Bolivian Military Aviation had warned General Kundt of the Paraguayan Army pincer movements in *Campo Via*, but the German general disregarded the reports that could have avoided such tragedy. The Paraguayan Air Arm supported the army actions against the Bolivian forts of *Saavedra, Muñoz, Herrera, Samaklay, Murjia, Cuatro Vientos, Platanillos, Bolivar, Loa* and *Camacho*, which were all conquered. These successful battles saw Brigadier General Estigarribia promoted to major general in a ceremony that took place near the battlefront led by the President of Paraguay, Dr Eusebio Ayala. On the opposite side, General Kundt was dishonourably removed from the Bolivian high command and replaced by General Enrique Peñaranda.

On 20 December 1933, a truce was established between the two countries. Many questioned it, especially in Paraguay since the victorious army could easily defeat the enemy and the truce was seen as giving extra time to Bolivia to reorganise its army. The Paraguayan government justified the truce for humanitarian reasons. Almost 9,000 Bolivian prisoners needed to be taken out of the battlefront, many of them wounded and poorly fed. They were taken in hundreds of trucks to the *Casado* railroad and then by ship to the capital. Once in Asunción, hundreds received medical attention. There were not any concentration camps in Paraguay, so the Bolivian prisoners had to work mainly in the construction of

roads and in agriculture. The captured Bolivian officers were kept in military bases under permanent guard. They were all treated humanely under the Geneva Convention regulations. Although most of them returned to Bolivia after the war, a few hundred stayed in Paraguay.

Hostilities resumed on 6 January 1934. Almost a month later, the *Comanchaco* issued Report Nr. 358 stating that three *Potez 25*s bombed the Bolivian positions at *Fort La China*, dropping 24 bombs and then strafing the troop concentrations. The Paraguayan Air Arm used only one kind of bomb, which was produced at the navy arsenal: it weighed 14 kilos 400 grams (almost 32 pounds) and it was affectionately called *"piña"* (pineapple) because of its appearance.

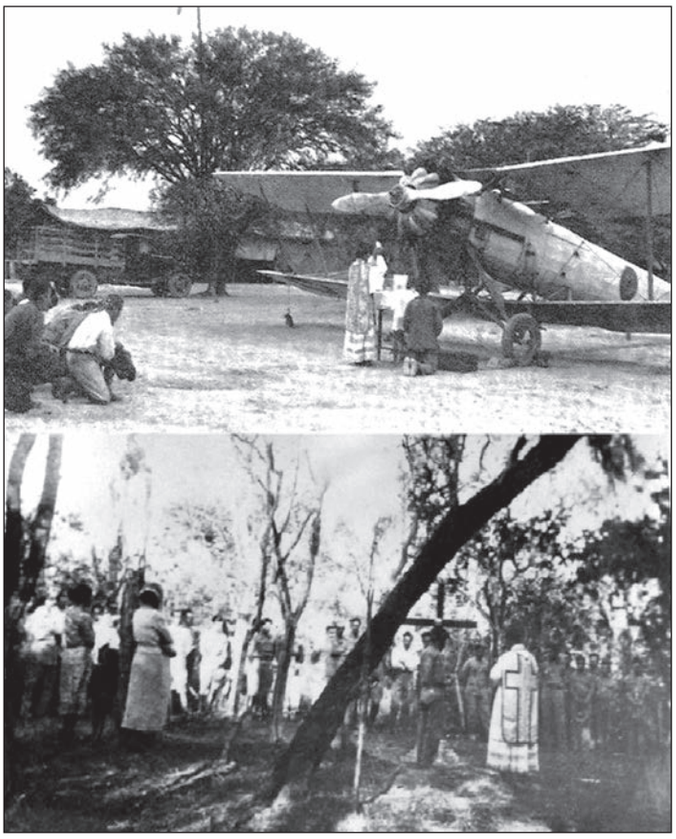
On 4 March, when returning from a recce mission, *Fiat C.R.20bis* serial 11-7, crewed by Captain PAM Bernardino Caballero Alvarez, inexplicably crash-landed at *Isla Poi AFB*, killing him. In the same month, the Paraguayan Army captured another 1,000 enemy soldiers after the Battle of *Cañada Tarija*.

On 28 March, Lieutenant José Arzabe and Sergeant Serapio Camacho – who crewed the *Junkers F-13L "Charcas"* – on a test flight after maintenance crashed near *Ballivián* because of marginal weather conditions. Both were killed. Even though a search party was immediately organised to rescue the aviators, the accident site was not located. It was some years after the war that the remains were found just by chance by some hunters. A few days later, Captain Rafael Pabón requested permission from General Peñaranda to carry out an air raid over *Asunción,* together with Jordán and Ernst, which was not authorised.

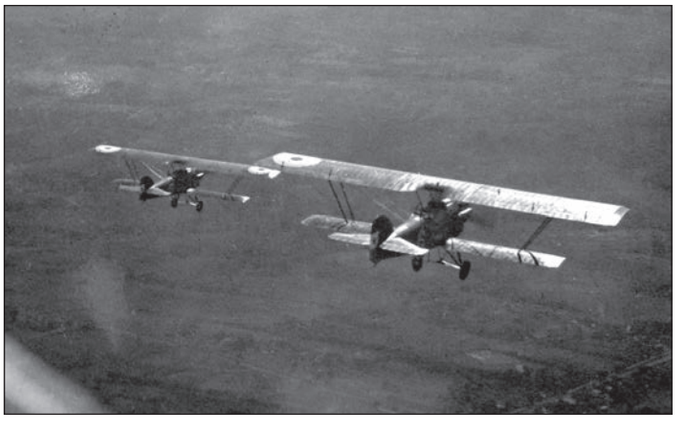
On 26 April, *Curtiss D.12 Falcon*, serial 17, crewed by Major PAM José Atilio Migone, escorted by two Fiat fighters, serial 11-5 crewed by navy First Lieutenant PAM Victor Urbieta Rojas and serial 11-3 by Captain HC Vladimir Porfenenko, performed a recce mission over the *Lóbrego* road to make an exact map of the area. On 2 May, some Bolivian Curtiss *Osprey* bombed the ports of *Leda, Diana* and *Guaraní* in the north front without causing a lot of damage, and on the following day the same planes strafed and bombed *Fort Patria*.

NCO MAM Adolfo Pastore (left) with a colleague posing with a *Fiat C.R.20bis* fighter at Isla Poi AFB in 1933. (Anibal Pastore)

A *"piña"* (pineapple) bomb used by the Paraguayan Military Aviation. (*Author*)



A Catholic mass celebrated by the army chaplain at *Villamontes AFB*. Part of the altar is a *Vespa* bomber (top). Also a Catholic mass at First Lieutenant PAM Walter Gwynn's grave at *Isla Poi AFB* in June 1933 (bottom). (*Alas de Bolivia* by Amalia Villa de la Tapia and *Victor Meden*)



A nice in-flight picture of *Potez 25A.2* serials 5 and 6. (*Tito Aranda*)

On 18 May, the third promotion of Paraguayan pilots – composed of second lieutenants PAM Enrique Planás, Orlando Salerno Netto, Homero Duarte, Abelardo Bertoni and Adbón Álvarez Albert – graduated from the Military Aviation School. Other pilots were incorporated into service during the rest of the war: Second Lieutenant PAM Arsenio Vaesken, Paraguayan, who became a pilot in France; Second Lieutenant PAM César Abente, Paraguayan, who received his wings in Mexico; First Lieutenant

PAM Bernardino Caballero Álvarez, Paraguayan, who studied in Chile; Captain HC Vladimir Porfenenko, a White Russian volunteer; and two Uruguayan volunteers, second lieutenants HC Benito Sánchez Leyton and Luis Tuya.

On 21 May, Captain Alfredo Pascoe Moscoso and Sub-Lieutenant Félix Mercado took off from *Port Suarez* in Curtiss *Osprey* serial 30 but, because of a severe storm, they decided to crash-land at *San Lorenzo*. Captain Pascoe was killed when the *Osprey* hit some trees and Sub-Lieutenant Mercado was severely wounded.

The *"ice"* bombing on the strongest siege

Not all were victories for the Paraguayan Army. Despite General Estigarribia's brilliant military strategy, there were a few setbacks, such as the one in the Battle of *Strongest.* On 23 May, during the Bolivian encirclement of Captain Joel Estigarribia's 171 soldiers at Strongest, *Potez 25TOE* serial 12, crewed by Lieutenant HC Benito Sánchez Leyton and Captain Obs. Aer. Job Von Zastrow, flew over the area to determine the weakest part of the siege in order to send the much-needed ammo and, above all, the vital water.

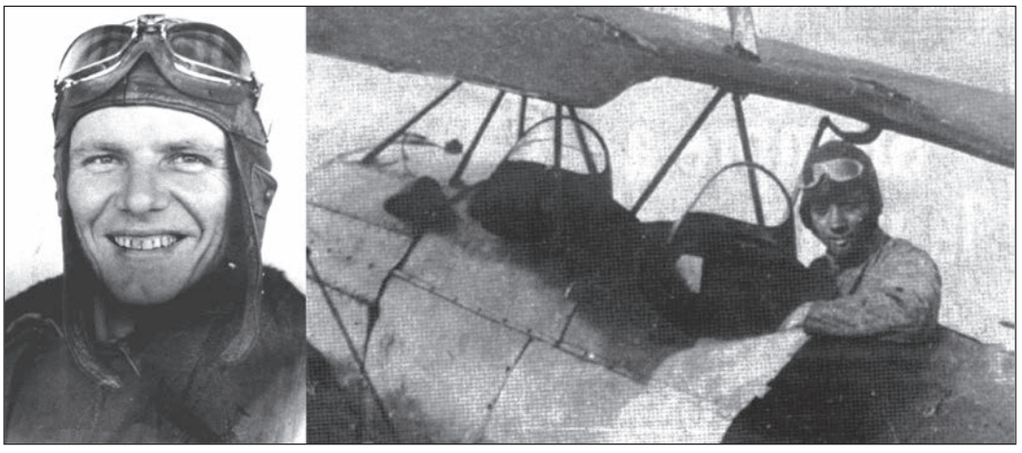
They were in the area for almost an hour and were attacked by AA machine guns. Lieutenant Sánchez Leyton was injured and decided to return to base at Cabezón. During the return flight, he lost a lot of blood and fainted, so Captain Von Zastrow took control of the bomber and as soon as they landed, Leyton was evacuated by air to the field hospital at *Isla Poi AFB*. Next morning, *Potez 13*, crewed by Second Lieutenant HC Luis Tuya and Captain Obs. Aer. Von Zastrow, together with *Potez 10* with Second Lieutenant PAM Arsenio Vaesken and Second Lieutenant Obs. Aer. Alejandrino Martinez, carrying ice bags, took off and headed to *Strongest,* where the bags were thrown to the besieged troops. It was very dangerous because they were only flying at 100 feet, heavily exposed to ground fire.

Believe it or not, the Pinasco tannin industry had an ice machine, so 12 ice bars were taken from there to Isla Poi AFB in one of the *Travel Air S6000B*, and from there to *Strongest* in the *Potez* bombers. Other flights took ammo to the troops but unfortunately Strongest fell into Bolivian hands soon afterwards. Once again, Bolivia did not take advantage of this victory and instead of starting a huge counteroffensive, the troops were withdrawn from the area.

Eighth air combat

On 9 June 1934, *Potez 25TOE* serial 13, crewed by Second Lieutenant PAM Homero Duarte and Captain Obs. Aer. Job Von Zastrow, on a recce mission over the Bolivian positions in *Pique Franco*, was attacked by a *Curtiss Osprey* crewed by Captain Jesús Mérida and Lieutenant Alfredo Pacheco. Both planes fired at each other without shooting the other down. Duarte made the typical evasive action that always frustrated the Bolivian pilots to get an air kill. After 20 minutes, and perhaps short of fuel, the *Osprey*

From left to right: Second Lieutenant PAM Abelardo Bertoni, Second Lieutenant HC Luis Tuya, Second Lieutenant Obs. Aer. Alejandrino Martínez, Second Lieutenant Obs. Aer. Héctor Vallejos and First Lieutenant PAM Orlando Salerno Netto at *Cabezón AFB* in June 1934. (*Museo Aeronáutico del Uruguay*)



Captain Obs. Aer. Job Von Zastrow (left) and Second Lieutenant Homero Duarte on board a *Morane-Saulnier M.S.35* (right). (*Instituto de Historia y Museo Militar del MDN*)

Potez 25TOE serials 10 and 7 at Ybamirante AFB in 1934 (left) and Second Lieutenant PAM Orlando Salerno Netto (right). (*Instituto de Historia y Museo Militar del MDN*)

withdrew from the area, and the *Potez* returned to its base in Camacho.

Ninth air combat

Potez 25TOE serial 10, crewed by Second Lieutenant PAM Osvaldo Salerno Netto and Second Lieutenant Obs. Aer. Alejandrino Martinez, on a recce mission over *Algodonal,* was attacked by two *Curtiss Hawk* fighters on 10 June. Lieutenant Martinez damaged one of the *Hawks*, which had to withdraw pouring white smoke. Salerno Netto then took evasive action to escape from the other Hawk. The Bolivian pilot could not shoot the bomber down and returned to its base.

Tenth air combat

On 18 June, during a recce flight over V Road between *El Carmen* and *Strongest, Potez 25TOE* serial 15 (ex 8), crewed by Second Lieutenant PAM Homero Duarte and Captain Obs. Aer. Job Von Zastrow, was attacked by Major Rafael Pabón's *Curtiss Hawk*. The *Potez* crew soon realised that the Hawk pilot was very experienced, so they immediately took evasive action while Von Zastrow frenetically fired his twin Madsen machine guns. Pabón knew this tactic very well, but he could not do much, although he wanted to get his second aerial kill. Many years later, a Bolivian Air Force officer who was a well-known historian in her country published a volume on the Chaco War, and clearly stated that Pabón shot down an enemy "*Fiat 23*" (sic) on 18 June 1934, killing its crew (Page 271, *Alas de Bolivia*, volume 2, by Lieutenant Colonel Amalia Villa de la Tapia). The true facts are that the Paraguayan plane was a twin-seater *Potez 25*, whose two crew members survived the war (Homero Duarte died in 2002 and Job Von Zastrow died in a civil plane crash in the 1960s) together with *Potez 15*; the Paraguayan Air Arm did not have any *Fiat 23* but single-seater *C.R.20bis*. Second Lieutenant PAM Duarte and Captain Obs. Aer. Von Zastrow received a War Citation for this successful mission. An unconfirmed episode related to this combat also says that when Pabón decided to return to his base he saw a biplane leaving the clouds nearby and thinking it was another Paraguayan bomber, decided to attack and shoot it down. Since there were no other Paraguayan aircraft in the zone, the plane Pabón attacked by mistake was Bolivian. Obviously, if this really happened, it was shamefully hidden from the public.

Eleventh air combat

A few days later, on 26 June, a bombing mission was carried out by three *Potez 25*: serial 15, crewed by Second Lieutenant PAM Homero Duarte and Captain Obs. Aer. Job Von Zastrow, serial 11, by Second Lieutenant PAM Orlando Salerno Netto and Second Lieutenant Obs. Aer. Alejandrino Martinez, and serial 5, by Second Lieutenant PAM Arsenio Vaesken and Second Lieutenant Obs. Aer. César Corvalán Doria. They dropped 400 kilos of bombs on the Bolivian positions at *El Carmen*. The three *Potez* were in a tight V formation dropping their bombs when they were attacked by a *Curtiss Osprey* crewed by Lieutenant José Chacón and Sub-Lieutenant Luis Torres Pascoe, and the Curtiss Hawk serial 40 with Major Rafael Pabón. The three *Potez* rear gunners aimed their twin Madsen machine guns at the attackers. The *Osprey* was damaged and withdrew, and Pabón could not break the tight formation and might not have wanted to risk his life with six machine guns firing at him, so he also returned to his base. This action saw the Paraguayan Air Arm receive the High Command Citation Nr. 290.

Some Bolivian pilots posing next to a *Curtiss Osprey*. (*Victor Meden*)

Presidential visits to the battlefront

Paraguayan President Dr Eusebio Ayala visited the battlefront 58 times during the war, dressed in an overall flight suit, normally on board the *Curtiss D.12 Falcon*, a *Potez 25* bomber or the *Consolidated Model 21*. He used to say that if his plane had been shot down, the enemy would have found *"an old sergeant"* in the gunner's cockpit.

On the other hand, Bolivian President Daniel Salamanca usually travelled in a comfortable *Junkers Ju.52 3/m* with suit and tie and accompanied by his vice president and ministers. He did not visit the battlefront as many times as his Paraguayan colleague. The political situation in Bolivia was very different: Salamanca did not have a good relationship with the army high command,

Paraguayan President Dr Eusebio Ayala (right) right after his arrival at the battlefront with his pilot Captain Leandro Aponte (left). The *"presidential"* plane was a *Potez 25* bomber on that occasion. (*Instituto de Historia y Museo Militar del MDN*)

Bolivian President Daniel Salamanca (first left), his Vice President Jose Luis Tejada Sorzano (second left) with General Enrique Peñaranda (centre) and other VIPs in Villamontes.(*Ramiro Molina Alanes*)

A Paraguayan Air Arm *Junkers A50fe Junior* at *Isla Poi AFB* in 1933. (*Colonel PAM SR Enrique Déntice*)

first because he chose a foreigner, General Hans Kundt, to lead the country's army, who proved to be a total failure. Kundt's successor, General Peñaranda, was not any better either so there was a lot of disagreement between the military and the civil government. The disagreement was so deep that during one Presidential visit to the city of *Villamontes,* Salamanca was forced to resign and Vice President José Luis Tejada Sorzano was appointed as President. In Paraguay, Dr Ayala had a harmonious relationship with General Estigarribia because they were close friends.

Getting ready for a mission. Ground crew posing with the pilot next to a *Potez 25* bomber at *Isla Poi AFB* in 1933. (*Instituto de Historia y Museo Militar del MDN*)

Some forts in the Chaco

Bolivian Name	Paraguayan Name
Aliguatá	Mayor Ruperto Zenteno
Aliguatá Viejo	Charata
Arce	Dr. José Gaspar Rodriguez De Francia
Bolivar	Tte. Jara Troche
Cabezon	Mayor Rodriguez
Cabo Castillo	Tte. Guillermo Arias
Camacho	Mayor César López De Filippis
Campo Jurado	Tte. Prat Gill
Cañada Tarija	Tte. Valinotti
Capiirendá	Oscar Carrera Saguier
Chuquisaca	Pitiantuta
Cururenda	Tte. Melgarejo
Huijay	Carayá
La China	Capitan Mazzei
Mandiyupecuá	Capitán Nicanor Torales
Masamaklay	Agua Rica
Muñoz	General Diaz
Picuiba	Nueva Asunción
Platanillos	Tte. Acosta
Sorpresa	Rojas Silva
Yayucubas	Capitan Oreffief Serevriacov
Ybybobo	Ayala Velazquez
Yrendagué	Cnel. Eugenio A. Garay
Yucra	Capitán Oscar Rivas Ortellado

An active Naval Aviation

On 9 September 1933, Savoia *Marchetti S.59bis* serial R-1, crewed by navy first lieutenants PAN Ramón E. Martino and Ramón Díaz Benza, on a recce mission over the *Camargo-Tortosa* area, north of *Fort Vitriones*, ran out of fuel. The crew tried to reach the river for an emergency landing but they lost altitude quickly and had to

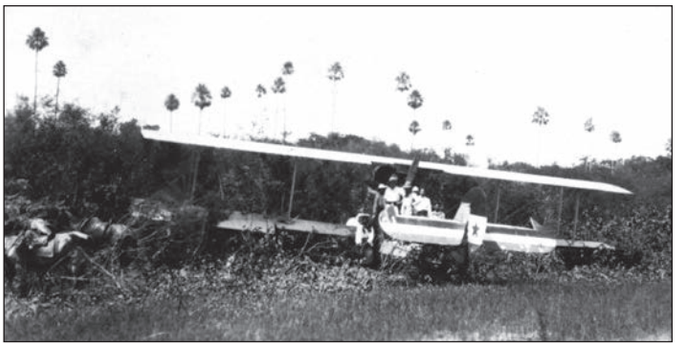
Savoia Marchetti S.59bis serial R-1 overflying the navy gunboat *"Tacuary"* at Bahía Negra in 1933. (*Archivo de la Armada Nacional*)

land on solid ground. Fortunately, their flying boat just received minor damage but they were in the middle of nowhere, in enemy territory, although the Paraguay River was just some metres away. They decided to dismantle the wing floats to be used as rafts. They also covered the plane with tree branches to hide it from the enemy planes. Once they reached the river, they sailed southwards, using pieces of wood as paddles. After a couple of days, they were rescued by some fishermen and taken to *Port Caballo*, in Paraguayan territory. The navy transport boat *Capitán Figari* was sent to bring them to *Bahía Negra*. Once there, Martino and Díaz Benza told their superiors exactly where they had left the Savoia and a rescue mission was organised. A whole navy platoon and some Naval Aviation technicians were sent by boat to the area and once they found the hydroplane, they pushed it to the river with the help of the ship's crane. It was then slowly towed to *Bahía Negra* where it was dismantled and taken to *Sajonia NAS* in Asunción on board a navy gunship. It took several months to repair the Savoia but it resumed active service.

A few days after this incident, both naval pilots were sent on another mission to the area, on the *Macchi M.18* R-3. They bombed and strafed the Bolivian forts of *San Juan, Santa Cruz* and *Vitriones.* On 5 October, they carried out a similar mission on *Fort Quijarro.* During the last months of 1933, the Naval Aviation made numerous photo-recce flights in the north front to prepare a detailed map of the whole area. In December, one of the Macchi crewed by Martino and Diaz Benza was sent deep inside the Chaco on a recce mission over the Bolivian fort of *Florida*, which was also strafed.

On 12 January 1934, one of the Macchi flying boats dropped six bombs on *Fort Vitriones*, killing a herd of cattle and some troops. A few days later, *Fort Florida* was also bombed and strafed by the Macchis.

On 2 July, *Macchi M-18* serial R-3, crewed by navy First Lieutenant PAN Ramon Martino, took off from its base in *Bahia Negra* for a recce mission in the *Florida* area. It discovered that there was a Bolivian Army corps getting ready to move towards the *Punta Rieles* railhead in order to cut down this important supply



Naval Aviation maintenance personnel on the *Savoia Marchetti S.59* rescue mission. (*Archivo de la Armada Nacional*)

A Paraguayan Naval Aviation *Macchi M-18A.R.* in its bamboo hangar at Bahía Negra. (*Tito Aranda*)

line for the Paraguayan Army. During the last two years of the war, the Paraguayan Naval Aviation was very active in carrying out many recce flights in the north front, which were later crowned with some nocturnal bombing missions.

The Paraguayan Naval Aviation flew a total of 1,039 hours between 1932 and 1935, carrying out 145 war missions.

Twelfth air combat

One of the most devastating missions of the Paraguayan Air Arm took place on 8 July 1934. Four *Potez 25*s were used to bomb Bolivia's most important stronghold in the Chaco, the fortress of *Ballivián,* with a permanent detachment of 10,000 soldiers, 200 trucks, a huge fuel and ammo depot, and an air base with a fleet of 8 to 10 *Curtiss Osprey*. The attacking Paraguayan aircraft were serial 13 crewed by Captain PAM Isidoro Jara, *Second Reconnaissance and Bombing Squadron* commander, and Second Lieutenant PAM Fabio Martinez, serial 15 with Second Lieutenant PAM Homero Duarte and Captain Obs. Aer. Job Von Zastrow, serial 5 with Second Lieutenant PAM Arsenio Vaesken and Second Lieutenant Obs. Aer. César Corvalán Doria, and serial 10 with Second Lieutenant HC Luis Tuya and Second Lieutenant Obs. Aer. Alejandrino Martinez, carrying a total of 800 kilos (1,764 pounds) of bombs. Early in the morning, the weather was overcast, so the mission had to be postponed for a few hours. Once the day became clear, the order was given to take off; there was no fighter escort this time because the Fiats were deployed in other bases. Once in the air, the four *Potez* flew in tight V formation because of the strong possibility of being attacked by fighters. The attack on *Ballivián* was a total surprise to the Bolivians since they had never thought they would be attacked by the *"weak"* Paraguayan Air Arm. In their first pass over the fortress, at 2,700 ft., the *Potez* released 30 percent of their bomb load, destroying the fuel and ammo depot, tens of trucks and the runway. On the second pass, the Bolivians started using AA machine guns unsuccessfully, and the *Potez* crews released another 30 percent of the bombs, causing more destruction and confusion. On that day, there were eight *Ospreys* in Ballivián and five of them were severely damaged in the second attack, and the other three could not take off because of the damaged runway. The alarm had been given by the Bolivians to a nearby air base, so two *Ospreys* and two *Hawks* took off and came to the rescue of Ballivián. They arrived at the moment the *Potez* initiated their third passage; Captain Isidoro Jara ordered to keep the tight formation to release the last 40 percent of the bomb load, which they did successfully, causing even more destruction, while the Bolivian fighters starting shooting. Without breaking formation, all the *Potez* rear gunners used their twin Madsen against the attackers. Captain Von Zastrow hit the attacking *Osprey* crewed by Major Eliodoro Nery and Sub-Lieutenant Rene Dorado, which engine smoked heavily, turned left and dived to a fatal crash nearby. Two of the Paraguayan gunners were wounded in the attack, second lieutenants Martinez and Corvalán, but they continued firing their Madsens, as also was one of the pilots, Second Lieutenant Vaesken, who could nevertheless still control his plane. Captain Jara then ordered the formation to return to its base keeping the tight V at a very low altitude; The other *Osprey* crewed by Lieutenant Alarcón and NCO Pol, and the Hawk piloted by Captain Juan Antonio Rivera were hit and withdrew from the chase, and after a few minutes, the only surviving Hawk, crewed by Sub-Lieutenant Carlos Lazo de la Vega, with eight Madsen machines guns aiming at it, did the same. The aerial kill described in this dogfight was (and still is) denied by Bolivians, who state that Dorado and Nery were not in *Ballivián* that day, and that they both died in a *"training"* mission in a Vespa in Villamontes on 17 July. The four *Potez* bombers returned to their base in Isla Poi and the wounded crew members were taken care of. Some days later, they all received War Citation Nr. 297 from the Paraguayan Air Army high command for their brilliant performance. The commander-in-chief of the Paraguayan Army, General Estigarribia, issued the official report Nr. 446 regarding this mission, mentioning the successful outcome and also the aerial kill. It was because of this outstanding performance that every 8 July the Fighter Aviation Day is celebrated in the Paraguayan Air Force.

Potez 25TOE serial 15 (ex-8), which bombed Ballivián on 8 July 8 1934 together with other three *Potez*. (*Instituto de Historia y Museo Militar del MDN*)

Thirteenth air combat

On 31 July, two Bolivian *Curtiss Osprey* attacked the *Picuiba AFB* without causing any serious damage. *Fiat C.R.20bis* serial 11-3, crewed by Second Lieutenant PAM Orlando Salerno Netto, took off to repel the attack. Salerno aggressively shot at the *Ospreys*, whose crews decided to abandon the place, perhaps short on fuel, and also because they had already bombed their target.

Fourteenth air combat

On 5 August, the *Curtiss D.12 Falcon* serial 17, crewed solely by Captain PAM Carmelo Peralta, on a routine flight to *Camacho AFB,* was attacked by three Curtiss *Osprey*, near Platanillos. Without his rear gunner, Peralta had very little chances of surviving a rear attack, so he dived at high speed and flew at tree-top level in zigzag with the three attackers on his tail. After a few minutes, the chase was seen by Paraguayan troops, who started AA fire against the *Ospreys*, much to Peralta's relief. The ground fire distracted the attackers, who stayed in the area for some strafing, and Peralta could escape.

Fifteenth air combat

In August 1934, General Estigarribia ordered the then battlefront commander of the Paraguayan Air Arm, Captain PAM Leandro

Second Lieutenant HC Luis Tuya, a Uruguayan volunteer with a *Fiat C.R.20bis* fighter at Ñu-Guazú AFB in May 1933. (*Museo Aeronáutico del Uruguay, Luis Tuya's collection*)

From left to right: First Lieutenant Obs. Aer. Rogelio Etcheverry, Second Lieutenant Obs. Aer. Rufino Arce, Captain PAM Carmelo Peralta, Second Lieutenant HC Luis Tuya, Second Lieutenant Obs. Aer. Cándido Ríos and First Lieutenant PAM Orlando Salerno Netto. (*Museo Aeronáutico del Uruguay, Luis Tuya's collection*)

Aponte, to prepare a recce mission over the *Florida-Madrejón* area since he had received some reports of a new Bolivian Army corps that was being formed in Ingavi by General Lanza in order to advance towards Punta Rieles railhead and attack the Paraguayan Army from the rear. The idea was to locate a new road being built by the enemy since the existing one was too narrow to be used by an entire army corps.

The main Paraguayan Air Arm air base was moved from *Isla Poí AFB* to *López de Filippis* (the ex-Bolivian *Camacho AFB*), where all the *Potez* of the *first and second recce and bombing squadrons*, and the Fiat of the *Eleventh Fighter Squadron* were deployed.

The mission was entrusted to Captain PAM Carmelo Peralta and First Lieutenant Obs. Aer. Rogelio Etcheverry, who were going to fly on the *Potez 25TOE* serial 11. Since the area to be explored was calm, the bomber would fly without fighter escort. Early in the morning of 12 August, the bomber took off and flew east towards *Punta Rieles* railhead. Once there, after overflying the zone for about 20 minutes and finding nothing strange, it headed north towards the *Pitiantuta* lagoon, and then northwest towards *Fort Colonel Bogado* in a two-hour leg. While flying over the fort it discovered a new road, which was appropriately recorded for the report. The flight continued to the forts of *Florida* and *Madrejón*, in a Bolivian-held territory, and while flying over the second fortress it saw a solitary *Osprey* on the runway but decided not to strafe it.

Soon, the Bolivians were alerted by the presence of an enemy plane, so an order to intercept and shot it down was issued immediately. The crew on duty at that moment was Major Rafael Pabón and his gunner, Sergeant Mario Calvo, who quickly boarded the *Osprey* serial 78 and took off to hunt what they might have probably considered 'easy prey'. Both Peralta and Etcheverry had not seen the *Osprey* taking off and coming towards them, so they headed south to Florida again. After a few minutes, First Lieutenant Etcheverry spotted the attacker and touched Captain Peralta's shoulder to get him ready for an evasive manoeuvre, which he did immediately, diving as fast as he could to reach the tree-top level. While they were diving, Pabón aimed a few rounds at them, hitting the fuselage and the empennage, overflying them because of its high speed. Peralta could continue diving without problems and then levelled off and reduced the bomber speed to almost stall

Potez 25TOE serial 11. (*Instituto de Historia y Museo Militar del MDN*)

Captain PAM Carmelo Peralta (left) and First Lieutenant Rogelio Etcheverry (right). (*Instituto de Historia y Museo Militar del MDN*)

while Pabón, who knew this tactic very well, was getting ready for a second attack. By then, Etcheverry was already aiming at him with his twin Madsen machine guns, shooting frenetically. Peralta also started changing course every 10–15 seconds and this time, Pabón's bullets hit the wings and once again, the *Osprey* gained altitude for another dive on the slow bomber. Etcheverry waited until Pabón was approximately 250–300 yards away before firing, aiming primarily at the engine and was lucky enough to hit it, since the *Osprey* began smoking heavily and its crew stopped shooting, probably because they were badly injured or dead. A few seconds after that, the *Osprey* turned left and dived without control, finally crashing in the woods. Peralta made a 180° turn to check the area where the *Osprey* crashed and both crew members saluted the fallen enemies as a sign of deep respect. It was exactly 0940. They decided to head southwest towards their base at *Lopez de Filippis*, where they arrived safely.

Once on the ground, both Peralta and Etcheverry immediately went to their commander's office to report what they had seen and done. Captain Aponte was so excited to learn about the aerial kill but he noticed that Peralta was not so enthusiastic; the pilot confessed that even though it was his duty to shoot an enemy down, he did not feel well after doing it. Aponte congratulated both crew members for the outstanding mission, none of them aware that the most famous Bolivian *"ace"* had been shot down.

Captain Aponte went directly to General Estigarribia's office to hand in a complete report of the mission. After a few days, Captain Aponte was called by the commander-in-chief to tell him

Major Rafael Pabon (left) and Sergeant Mario Calvo (right). (*Alas de Bolivia* by Amalia Villa de la Tapia)

Pabón's funeral on 24 August 1934 at La Paz, Bolivia. (*Fuerza Aérea Boliviana*)

that their intelligence unit had intercepted an encoded message from the enemy, which stated that the pilot who was shot down on 12 August was in fact Major Rafael Pabón. It was only then that Peralta and Etcheverry learned the identity of their attacker. This air combat received a lot of publicity not only in the armed forces but also in the civilian population. General Estigarribia issued Report Nr. 464 on this mission, and in a couple of days, all the Paraguayan newspapers gave ample coverage. Etcheverry was a soccer player before the war, playing for the *Olimpia Club* as a centre-forward, so one of the most famous headlines was *"Etcheverry scored a goal in the Chaco"*. Three days after this combat, a *Curtiss Osprey* piloted by Captain Juan Antonio Rivera located the remains of Pabón's *Osprey* 10km south of Florida and a rescue party was sent to the area to recover the corpses.

Of course, the Bolivian high command tried to minimise the situation, stating that Pabón died in an *"accident"* in the Chaco right after shooting an enemy plane down, and even many historians in that country still believe this version. The truth is that the *Osprey* stayed in the Chaco forever and the *Potez* returned to its base to tell the real story.

Picuiba AFB bombed and conquered

Just two days after Peralta and Etcheverry's successful mission, three *Potez 25*s carried out a bombing raid on the Bolivian AFB of *Picuiba*, partly destroying the air strip, several AA guns and the facilities. The Paraguayan infantry conquered the place on the following day and later changed the name to *Nueva Asunción*. The *Ospreys* and *Hawks* that were stationed in *Picuiba* were transferred to *Macharetí*. Then, on 8 September, once the runway was repaired, a couple of *Potez* bombers were deployed there from *López de*

Second Lieutenant Obs. Aer. Héctor Vallejos posing next to *Potez 25TOE* serial 12 in Picuiba AFB in 1934. (*Tito Aranda*)

Filippis AFB. On the same day, a mission was carried out by *Potez 12*, crewed by Second Lieutenant HC Luis Tuya and Captain Obs. Aer. Cándido Rios, and *Potez 5* by Second Lieutenant PAM Homero Duarte and First Lieutenant Obs. Aer. Rogelio Etcheverry, over the Bolivian positions at *Algodonal* and *Puesto La Rosa*. Once there, both bombers strafed the troop concentration, causing a lot of casualties. Both bombers then flew over the Paraguayan troops besieged at *Ysiporendá,* where they threw a small capsule with precious information to break the siege.

Sixteenth air combat

On 22 September, *Potez 25* serial 5, crewed by Second Lieutenant PAM Homero Duarte and First Lieutenant Obs. Aer. José C. Rios, on a recce mission over the *Algodonal-La Rosa* area, escorted by *Fiat C.R.20bis* serial 11-5 with Captain PAM Tomas Ruffinelli and *Fiat* serial 11-3 with Second Lieutenant PAM Orlando Salerno Netto, were attacked by three *Curtiss Ospreys* crewed by Captain

Not a very safe to be for a cute girl. At the end of the war, some officers took their wives and children to Isla Poi AFB, since the possibility of a Bolivian air raid was remote. Note the *Potez 25TOE* bomb racks and the propeller sheath. (*Instituto de Historia y Museo Militar del MDN*)

Three *Fiat C.R.20bis* at *Isla Poí AFB* in 1934 (left) and fighter pilot First Lieutenant PAM Tomás Ruffinelli (right). (*Instituto de Historia y Museo Militar del MDN*)

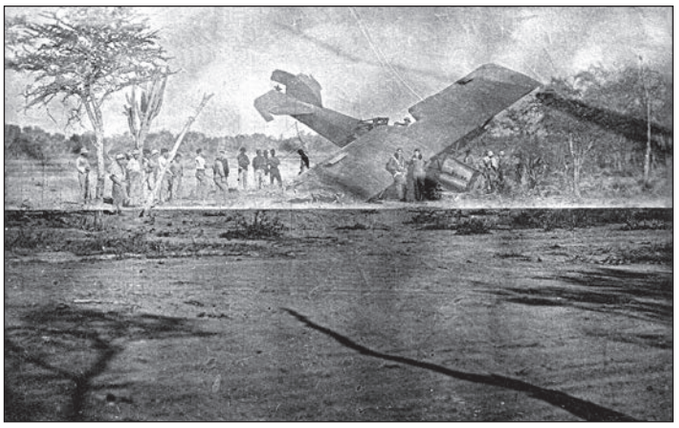
Rivera, sub-lieutenants Beltrán, Paz Soldán and Alarcón, and NCOs Solares and José Vargas. The Fiat fighters soon engaged with the *Ospreys* while the solitary *Potez* carried on its mission, which was to prepare a detailed map of the Bolivian positions in that sector, later thrown in a capsule to the Paraguayan Army sixth division command. After about 15 minutes of shooting at one another, all the *Ospreys* and Fiats, short on fuel, withdrew to their bases.

Seventeenth air combat

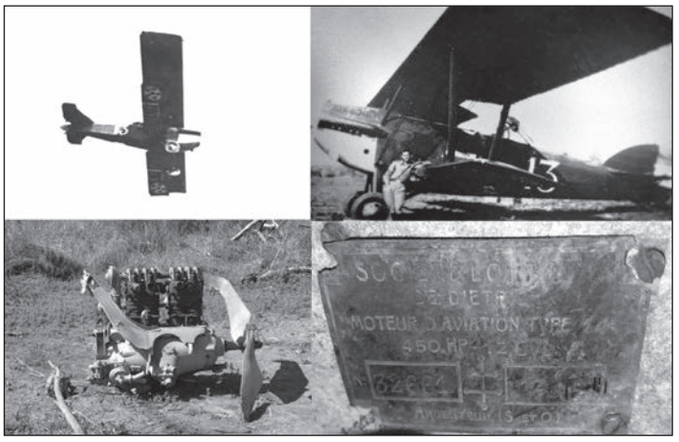
The following day, on a very similar mission, *Potez 25TOE* serial 11, crewed by Captain PAM Carmelo Peralta and First Lieutenant Obs. Aer. Rogelio Etcheverry, after returning from a recce mission over *Algodonal,* escorted by *Fiat* serial 11-5 with Captain PAM Tomas Ruffinelli and 11-3 by Second Lieutenant PAM Abelardo Bertoni, and being close to their base at *Picuiba*, were attacked by two Curtiss *Ospreys* crewed by sub-lieutenants Alberto Paz Soldán Pol and Sinesio Moreno. During this dogfight, one of the *Ospreys* fired at Ruffinelli's Fiat at the precise moment he was turning his head left to check his tail; when he looked at his windshield, he found several bullet holes; if he had not turned his head, he would have been instantly killed! After a few minutes, the *Osprey* returned to their base and so did the *Potez* and the Fiat. Two days after this mission, General Estigarribia visited the base and when he saw Ruffinelli's windshield he asked him how old he was; Ruffinelli, surprised by the question, answered he was 24, so Estigarribia immediately corrected him by saying that he was "two days old".

El Carmen battlefront

In November 1934, the Paraguayan Air Arm carried out several recce and bombing mission in the *El Carmen* area and the crews were able to prepare a detailed map of the zone. The information gathered by the crews was very useful for the Paraguayan Army High Command, enabling it to plan a huge offensive in the area. On 16 November, *El Carmen* fell into Paraguayan hands. During the Battle of *El Carmen*, Bolivians carried out a series of bombing missions with the *Junkers K.43s*, escorted by *Curtiss Ospreys*, over the enemy positions. On 17 November, Paraguayan troops captured *Ballivián*, one of the most important Bolivian strongholds. In the last days of that month, *Potez 25* bombers flew over the *Ybybobo-Bolivar-Carossi* sector and detected a long column of Bolivian trucks with troops; the high command was informed. During December, more recce missions were carried out over *Capiirenda* and *Ybybobo*, and later on *Cururendá* and *Las Moras,* where the enemy had left the area. On 8 December, Paraguayan troops captured the Bolivian fort of *Yrendagué* where an air base was later built.



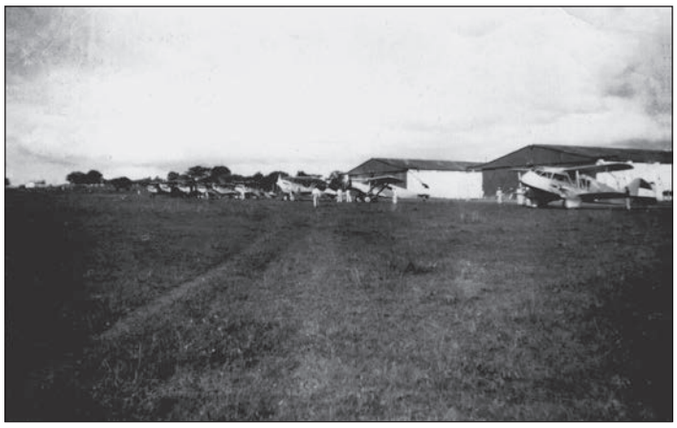
Not a happy landing for *Potez 25TOE* serial 7, crewed by Second Lieutenant PAM Gonzalo Samaniego Abente and Second Lieutenant PAM Hermes Gomez at *Cañada Oruro*. The bomber was later repaired and resumed service. (*Dr Hermes Gomez Ginard*)



In July 2016, the *Potez 25TOE* serial 13 *Lorraine-Dietrich 12Eb* engine was found in the El Carmen area where the bomber landed after being hit by two Bolivian *Curtiss Hawk* fighters on 11 December 1934. Part of the landing gear, the radiator and other metal debris were also found, and they will be exhibited in the Ministry of Defense Military Museum in Asunción. (Instituto de Historia y Museo Militar del MDN and Jeffry Harder Toews)

Eighteenth air combat

On 11 December 1934, *Potez 25TOE* serial 13, crewed by second lieutenants PAM Arsenio Vaesken and Abelardo Bertoni, in a recce mission over the Bolivian positions in the *El Carmen* area, was attacked by two *Curtiss Hawk* fighters crewed by lieutenants Alberto Alarcón and Emilio Beltran. The Hawk's crossfire damaged the bomber's engine, which smoked heavily. Second Lieutenant PAM Vaesken immediately searched for a suitable place to make an emergency landing since they were flying too low to use their parachutes. Fortunately, having seeing the bomber going down, both Bolivian fighters left the area and the *Potez* could land in an open field nearby. As soon as the machine stopped, both crew members jumped out and could not do anything to extinguish the fire to save the plane, which was totally burned out. Bertoni was slightly injured and they had to walk for two days to find Paraguayan troops. This was the second and last Paraguayan plane to be shot down by the enemy. Incredibly, almost 82 years later, the metal remains of *Potez 13* were found and taken to Asunción in order to be preserved in the Museum of Military History of the Ministry of Defense.



Ñu-Guazú *AFB* in 1934. (*David Demestri*)

An NCO about to start a *Travel Air S6000B* engine at Isla Poi AFB in 1934. (*Instituto de Historia y Museo Militar del MDN*)

More pilots and aircraft mechanics

On 21 December, the fourth promotion of pilots graduated from the Paraguayan Military Aviation School. The following officers received their pilot's wings: First Lieutenant PAM Pablo Stagni, and second lieutenants PAM Juan Pedretti, Gonzalo Samaniego Abente, Fernando Pérez Veneri, Hermes Gomez Lezcano, Abdón Caballero Alvarez, Antonio Esteche, Luis Escario, Enrique Déntice, Fabio Martinez, Juan Amarilla Ortiz and Lucio Ayala. They were all sent to the battlefront and were in active service in the last six months of the war. At the same time, the third promotion of aircraft mechanics also graduated, including the following NCOs: MAM Olimpio Ortiz, Alejo Silva, Aníbal Pastore, Adolfo Arriola, Tito Bogado, Rafael Amarilla Ortiz and Raúl Sosa Valdez.

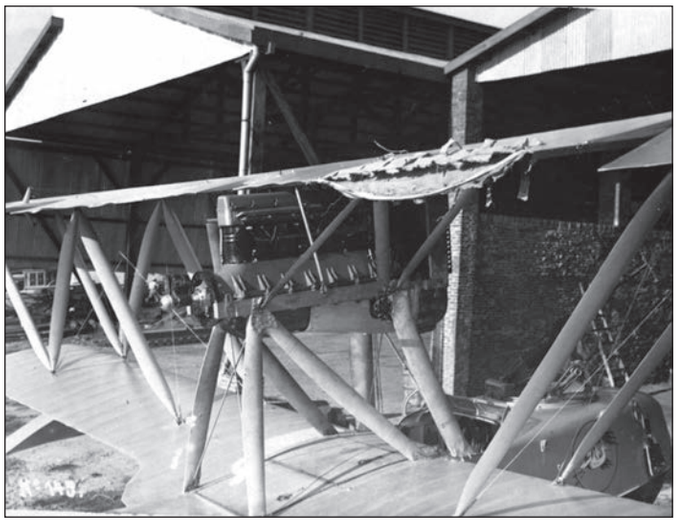
The Naval Aviation night-bombing missions

On 22 December 1934, the *Macchi M-18AR* serial R-5, crewed by navy First Lieutenant PAN Ramon E. Martino and Captain Obs. Aer. Job Von Zastrow, took off from its base at *Bahia Negra* at 0300 carrying 120 kilos of bombs for a raid. During 1933 and 1934, navy first lieutenants Martino and Diaz Benza had prepared a very detailed map of the north front during many recce missions in the area, and with the help of this map and also stellar navigation, they followed the course of the Paraguay and Negro rivers and reached the Bolivian fort of *Vitriones* first, where they released a few bombs. The damage was not very important but the psychological impact of being attacked at night was huge for the Bolivians. They then headed to *Alta Vista* and *San Juan*, where they dropped the rest of the bombs with the same outcome, returning to *Bahia Negra* at about 0700. It is because of this successful mission that the Day of

Second Lieutenant MAM Agustín Pasmor, maintenance chief of the Paraguayan Air Arm, in the rear cockpit of the *Potez 25TOE* serial 13 with the twin Madsen. On many occasions he fired at the attacking Bolivian planes. (*Colonel MAM Ret. Agustin Pasmor*)

Navy First Lieutenant PAN Ramón Martino (left) and a *Macchi M-18A.R.* at Bahía Negra NAS in 1934 (right). (*Archivo de laArmada Nacional*)

the Paraguayan Naval Aviation is celebrated every 22 December. Three more night-bombing missions were planned and carried out with the same hydroplane and crew; the second took place on 31 December, over the Bolivian forts of *Vitriones, Mariscal Santa Cruz* and *Quijarro*; the third on the following day, 1 January 1935, again against *Vitriones* and *Quijarro*; and the fourth on 11 January, against *Vitriones*.



A *Macchi M-18A.R.* at *Sajonia NAS* showing some damage in the upper wing, probably due to AA fire. The propeller had been removed from the 250hp six-cylinder *Isotta-Fraschini* engine. (*Archivo de la Armada Nacional*)

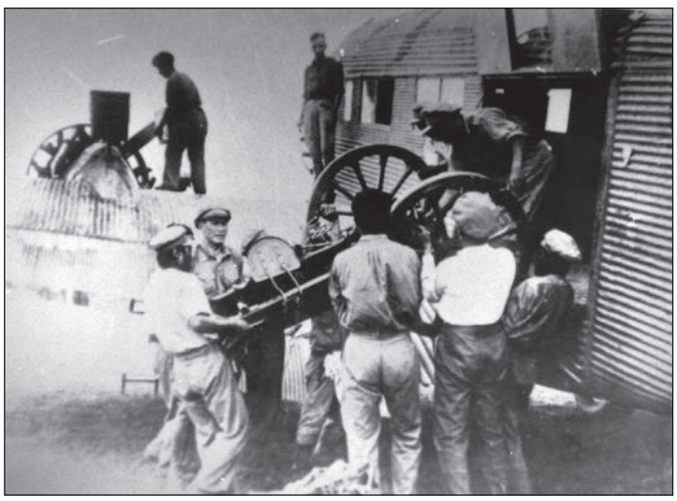
Third Bolivian plane shot down

On 26 December 1934, *Curtiss Hawk* serial 30, crewed by Lieutenant Carlos Lazo de la Vega, in a recce mission over the *Puesto Central* zone, was shot down by AA-fire; its only crew member was killed instantly.

Bolivian troops expelled from the Chaco

With the outstanding victory at *Ybybobo*, the Bolivian Army was finally expelled from the Chaco region, although the war would last another half a year more. Meanwhile, the *Consolidated Fleet* serial E-11, crewed by Second Lieutenant PAM Antonio Esteche and Cadet Lucio Ayala, on a liaison mission to the Chaco, crashed while approaching *Concepción* air strip, killing Esteche instantly; Ayala was slightly wounded.

Lieutenant Carlos Lazo de la Vega's *Curtiss Hawk* No. 30 remains. (Revista *Alas Paraguayas*)



A howitzer being loaded aboard a *Junkers Ju.52*. (*Ramiro Molina Alanes*)

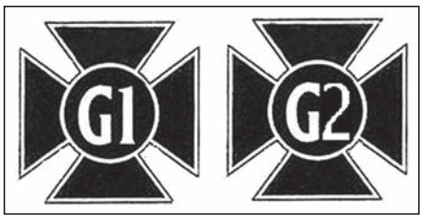
Reorganisation of the Bolivian Military Aviation

During the last months of the war, the Bolivian Military Aviation had to withdraw from the air bases of *Ballivián*, *Cururrendá, Ybybobo, Strongest*, *Carandayty* and *Macharetí* because of the Paraguayan Army offensive. All the aircraft were redeployed to *Villamontes, Yacuiba, Cuevo, Choretí* and *Charagua*.

At the end of 1934, the Bolivian Military Aviation was reorganised into two combat groups: *Combat Aviation Group Nr. 1* (G.1) *"Major Nery"* (*"Grupo Aéreo de Combate Nro. 1"*), whose commander was Major Jorge Jordán in *Villamontes AFB,* including a fighter squadron with *Curtiss Hawk* and *Osprey,* whose commander was Captain Leónidas Rojas, and a bomber squadron with *Junkers K.43* with Captain Luis Paravicini as commander; and *Combat Aviation Group Nr. 2* (G.2) *"Major Pabón"* (*"Grupo Aéreo de Combate Nro.2"*), whose commander was Major Luis Ernst Rivera in *Cuevo AFB*, including a fighter squadron with *Curtiss Hawk* and *Osprey*, and a bombing squadron with *Curtiss Cyclone Falcon*. The new organisation still kept the *Training Squadron* at the *Military School of Aviation* and the *Transport Squadron*.

Last air combat

Exactly six months before the ceasefire, the last air combat took place, although the recce and bombing raids of both aviation forces continued until June. *Potez 25TOE* serial 15, crewed by Captain PAM José María Fernández (commander) and Captain Obs. Aer. José Cándido Rios, *Potez 25TOE* serial 12 with Second Lieutenant Homero Duarte and First Lieutenant Obs. Aer. Hector Vallejos, and *Potez 25A.2* serial 5 with First Lieutenant HC Benito Sanchez



The G.1 and G.2 badges. (*Author's files*)

Captain Ricardo Rocha in a *Curtiss Osprey* at *Cuevo AFB.* Note the *"Grupo de Aviación Nr. 2"* badge painted on the fuselage. (*Instituto de Historia y Museo Militar del MDN*)

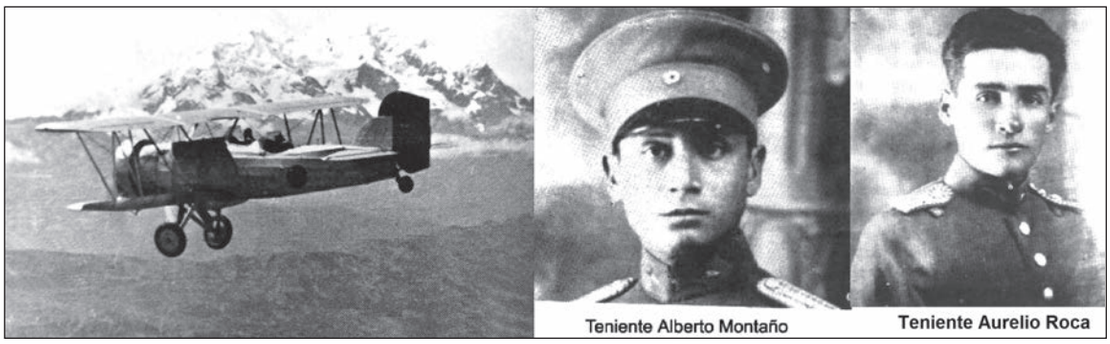
Bolivian *Curtiss Hawk II* serial 46 flying alongside a *Junkers*. (*Mark Christie Wörner*)

The Paraguayan Minister of the Treasury, Dr Benjamin Banks, in the gunner's cockpit on one of his visits to the battlefront, together with Captain PAM José María Fernández. (*Instituto de Historia y Museo Militar del MDN*)

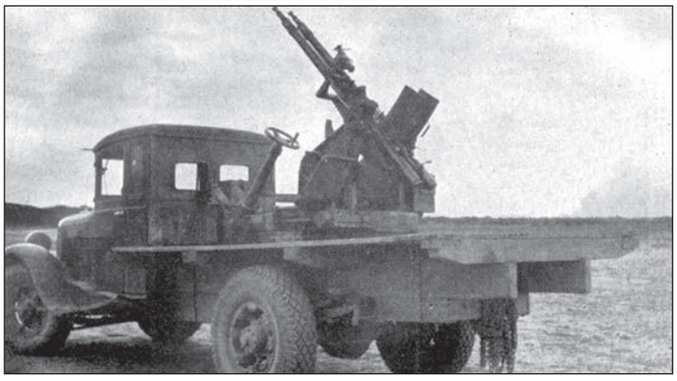
Leyton and First Lieutenant Obs. Aer. Juan Amarilla, in a recce and bombing mission over the Bolivian positions in the *Carandayty* area, were attacked by five *Curtiss Hawk* fighters crewed by Major Luis Ernst Rivera, Captain Juan Antonio Rivera, and lieutenants Alberto Alarcon, Alberto Paz Soldán and Luis Soria. Captain Fernandez ordered tight formation at tree-top level and at very low speed and all the gunners aimed at the attackers, while the pilots reached their destination and released all the bombs as planned. Even though the *Hawks* attacked several times, they could not break the tight formation and after about 20 minutes in the area, the attackers left the zone, but not before damaging *Potez 5*'s engine, which began to smoke. Fortunately, it reached its base where it was later repaired. A few days later, Paraguayan troops reached the *Parapití* River, the claimed historical border.

Fourth and fifth Bolivian planes shot down. The Battle of *Villamontes*

During the preparations for the defence of the town of *Villamontes*, the Bolivian high command deployed some Hawk fighters, *Osprey* and *Cyclone Falcon* fighter-bombers and *Junkers K.43* bombers in the town's base. The *"Mixed Air Group"* (*"Grupo Aéreo Mixto"*) was directed by Major José P. Coello. Captain Leónidas Rojas was the fighter commander and Captain Paravicini was the bomber commander. Several pieces of *Oerlikon* AA-guns were also

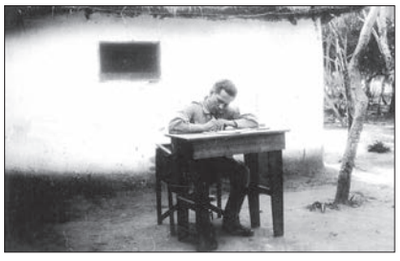


A *Curtiss Cyclone Falcon* (left). Lieutenant Montaño and Roca, pilots who were killed in the two *Cyclone Falcons* shot down by AA-fire during the Battle of Villamontes. (*Ramiro Molina Alanes*)



Bolivian Army *Oerlikon* AA-guns mounted on a truck. (*Fuerza Aérea Boliviana*)

Paraguayan troops with a captured *Semag-Becker AA-gun*. (*Instituto de Historia y Museo Militar del MDN*)



A Paraguayan pilot writing a letter home at Isla Poi AFB. (*Instituto de Historia y Museo Militar del MDN*)

A Paraguayan Air Arm *Potez 25TOE* bomber flying over Bolivian territory in the last months of the war. (*Archivo del Instituto de Historia y Museo Militar del MDN*)

deployed around the base to repel air attacks. All the Paraguayan infantry attacks were repelled by the fierce defenders of the town, with the precious help of their military aviation, causing many casualties. On 12 January 1935, *Curtiss Falcon* serial 207, crewed by Lieutenant Aurelio Roca and Sub-Lieutenant Heraclio Melgar, on a recce mission over Paraguayan positions was shot down by AA-fire near *Villamontes.* Lieutenant Roca was killed and Sub-Lieutenant Melgar was seriously wounded. A few days later, on 19 January, another *Curtiss Falcon*, crewed by Lieutenant Alberto Montaño and Sub-Lieutenant Nicolas Rojas, was also shot down by AA-fire near *Villamontes*, both crew members being killed in the crash. The Bolivian Army acquired twelve 20mm *Semag-Becker* AA-guns before the war and sixteen *Oerlikon* AA-guns in 1934 and could never shoot down any Paraguayan plane during the entire war. Of the AA-guns mentioned above, two were captured when *Boquerón* fell into Paraguayan hands in September 1932, with 300 rounds, and five more were captured after the *El Carmen* Battle in 1934, which as an irony were also used to shoot down Bolivian planes.

During the Battle of *Villamontes*, the Bolivian Military Aviation was very active. On 24 January, eleven aircraft including three *Junkers K.43*, two *Curtiss Osprey* and two *Curtiss Cyclone Falcon*, escorted by three *Curtiss Hawk* and a single *Vickers Scout,* bombed the Paraguayan positions near the city, causing many casualties.

More Paraguayan victories

On 23 January 1935, Paraguayan troops conquered *Carandayty* and *Boiyubé,* cutting the supply lines between the cities of *Villamontes* and *Santa Cruz de la Sierra*. The intention was to capture the oil wells at *Camiri* but it was not possible because of a huge Bolivian counteroffensive. General Estigarribia moved his troops to the *Villamontes* front in order to capture this very important city, but it was very well defended. It was during this battle that two Curtiss Falcon were shot down as described above, but the Paraguayan troops suffered a lot of casualties and *Villamontes* was never conquered. Logistics was a tremendous problem for the Paraguayan Army since supplies had to be transported hundreds of kilometres; there were no big transport airplanes for that task and the roads were in miserable condition. Bolivia had *Junkers Ju.52* transport planes and its supply lines were closer. The Paraguayan troops had to retreat south of the *Parapití* River.

The bombing raids on *Charagua*

Charagua was a town situated north of the *Parapití* River, in unquestionably Bolivian territory. The Paraguayan high command decided to bomb and conquer it, so an air raid was planned for 11 March 1935. On that date, four *Potez 25* bombers with full load, crewed by Captain PAM Victor Vallejos and First Lieutenant Obs. Aer. Rogelio Etcheverry, first lieutenants PAM Hermes Gomez and Pablo Stagni, and First Lieutenant PAM Gonzalo Samaniego and Second Lieutenant PAM Abelardo Bertoni, dropped almost 500 kilos of bombs over *Charagua*, destroying the Bolivian Second Army Corps facilities and causing a lot of casualties. A second raid was carried out on 14 March with the same aircraft and crew, causing even more destruction. The civil population of the town had been evacuated and only military personnel remained in the zone. A third raid took place on 25 March. The Paraguayan Army could then conquer *Charagua* but only for a few days since another Bolivian Army corps made a counteroffensive manoeuvre and the Paraguayans had to retreat to the *Parapití* River once again.

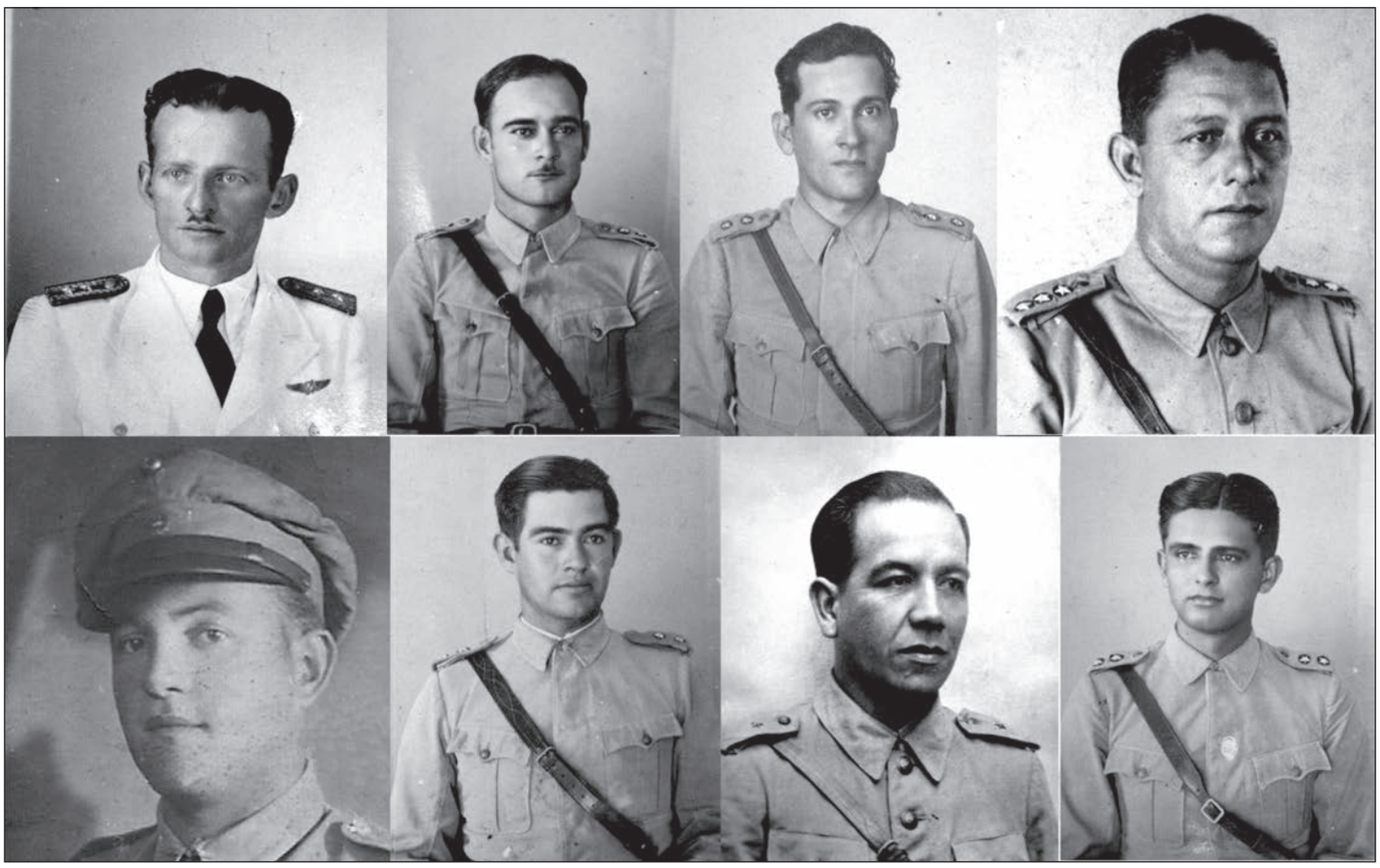
During April, the Paraguayan Air Arm made a series of photo-recce flights over the *Camiri* oil wells, the first of them by *Potez 25A.2* serial 5, crewed by first lieutenants PAM Hermes Gomez and Pablo Stagni. The following morning, *Potez 25TOE* serial 10, crewed by Captain PAM Roman Garcia and First Lieutenant Obs. Aer. Rogelio Etcheverry, and incredibly a third crew member, Second Lieutenant PAM Fernando Pérez Veneri, with the same mission as the one described above had technical problems with the engine and made an emergency landing near Fort Independencia. Unfortunately, the bomber was damaged beyond repair, although its crew escaped unharmed. *Potez 9* and 11 also participated in this mission.

At the end of the war, the Bolivian Military Aviation had four air groups: The *Transport Squadron* with the LAB fleet, the *Mixed Air Group Nr.1* at *Villamontes-Yacuiba,* the *Mixed Air Group Nr.2* at *Cuevo-Charagua* and the *Osprey Squadron* at *Ingavi-Puerto Suarez*.

The end of hostilities

During May and June, the Paraguayan Air Arm carried out a series of recce and bombing raids all over the front. In the first days of June, the Bolivians bombed *Fort Ingavi* using some *Ospreys*. Some days later, *Ospreys* also attacked the Paraguayan positions in *Yrendagué*, destroying vital water wells. One of the last actions of the Bolivian Military Aviation was carried out by a couple of *Ospreys* crewed by lieutenants Paz Soldán and Chacón, with NCOs Donoso Torrez and Larrieu, near *Cuevo*, where they bombed the Paraguayan positions in the area. On 12 June, the armistice was signed by both countries and two days later, on 14 June, the ceasefire was established. On 15 June, a Paraguayan delegation was transported aboard the *Breda Ba.44* serial T-15, crewed by Captain PAM Emilio Nudelman, to *Villamontes*, and the following day, Paraguayan and Bolivian pilots fraternised at *Ybamirante AFB*; they had forgotten all the past actions and shared anecdotes, having drinks and lunch together. Then they decided to prepare a formal declaration, which stated:

> The Bolivian and Paraguayan wings, merged into a fraternal embrace of peace, sealed with this declaration of true fellowship, and after three years of bloody struggle, friendship henceforth joins two brother nations of this continent. The undersigned, soldiers of



Some Paraguayan Air Arm aircraft mechanics. Top row, from left to right: First Lieutenant MAM Agustín Pasmor, Aníbal Zavala Spika, Raúl Sosa Valdez and Captain MAM Lauro Keim. Bottom row, from left to right: NCO MAM David Demestri, First Lieutenant MAM Tito Bogado, Captain MAM Basilicio Acosta and First Lieutenant Anibal Pastore. (*Instituto de Historia y Museo Militar del MDN*)

First Lieutenant PAM Hermes Gómez with a *Fiat C.R.20bis* fighter. (*Dr Hermes Gómez Ginard*)

the air, early in the war and peace, give their first comprehensive step to firmly state that in this part of America no more wars must take place between our nations, which have the same ideal: The Progress of Latin America."

For the Paraguayan Wings, Major PAM José Atilio Migone, Captains PAM Gregorio Morínigo, Emilio Nudelman and Román García, and First Lieutenants PAM Pablo Stagni, Homero Duarte and Hermes Gómez.

For the Bolivian Wings, Captain Max Iñiguez, Sub-Lieutenants Sinesio Moreno, Alejandro Robles and José Ureña.

On 21 June, the President of Paraguay, Dr Eusebio Ayala, travelled to *Camacho* aboard the *Breda Ba.44,* piloted by Captain PAM Emilio Nudelman, with a technical stop at the port of *Pinasco*. In *Camacho,* he was transferred to a *Potez 25* bomber, crewed by Captain PAM Roman Garcia, to continue his trip to *Capiirendá,* where he was received by the commander-in-chief, General José Félix Estigarribia and the members of the International Military Neutral Commission.

On 22 August, in front of more than 50,000 people, the victory parade took place in *Asunción*, with more than 7,000 troops led by General Estigarribia, overflown by 12 aircraft, including four venerable *Potez 25* bombers (the other two were in maintenance), two *Fiat C.R.20bis* fighters and some other types.

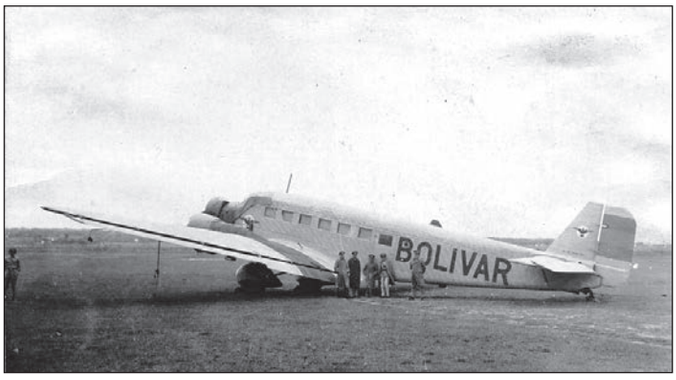
During September, General Estigarribia visited the Military Aviation School and made the following remark:

> Above the imperfections of the machines, above the superiority of the enemy, the flight of your Paraguayan hearts has overcome all difficulties. Those of us, who have seen you flying in the Chaco, are very aware of your sacrifice; we have perceived that you had flown in the wings of glory.

A few days after that, the Bolivian *Junkers Ju.52/3m* named *"Bolivar"* landed at Ñu-*Guazú AFB*, which brought the International Military Neutral Commission from Villamontes.

The Paraguayan Air Arm *Breda Ba.44* serial T-15 with a couple of Argentinean *Junkers K.43* at the *Villamontes* air strip after the ceasefire in June 1935. (*Ramiro Molina Alanes*)

Major General José Félix Estigarribia (centre) leads the victory parade in Asunción. Note the four *Potez 25*s flying over the city. (Instituto de Historia y Museo Militar del MDN)



The Bolivian *Junkers Ju.52/3m "Bolivar"* at Ñu-Guazú AFB right after the ceasefire. (*Instituto de Historia y Museo Militar del MDN*)

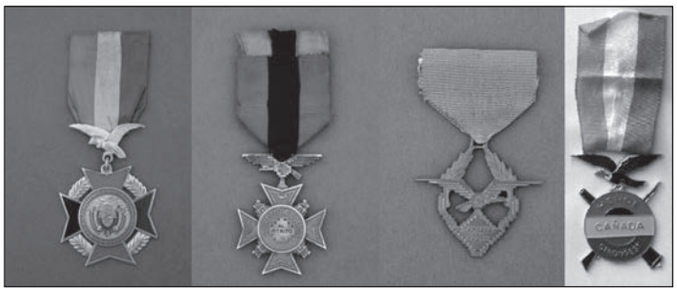
The post-war period (1935–39)

The definitive peace process was long and difficult and the Treaty of Peace, Friendship and Borders was not signed until 21 July 1938. Even though both countries' economies were devastated after three years of war, Bolivia and Paraguay bought more modern armament, including aircraft. Bolivia acquired three *Klemm Kl.25* primary trainers, four twin-engine *Junkers Ju.86* – two of them *Ju.86E* bombers and two *Ju.86Z* for transport, but easily convertible to bombers – directly from the factory in Germany, and ten *Curtiss-Wright CW.19R All Metal* fighters in 1938.

The Paraguayan government led by Colonel Rafael Franco

The *Junkers Ju.86Z* named *"Illimani"* and the Chaco War veteran *Junkers Ju.52 "Huanuni"* at El Alto airport near La Paz in 1938. (*Ramiro Molina Alanes*)

President Félix Paiva decorating the Paraguayan Air Arm war flag with the Chaco Cross on 26 July 1939. (*Instituto de Historia y Museo Militar del MDN*)

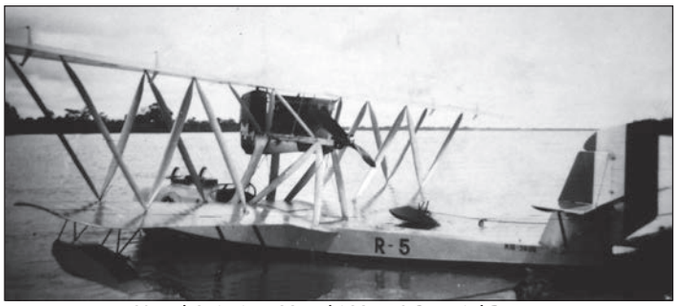


The four highest Bolivian decorations, from left to right: the *"Honorable Congress Medal for the Defenders of the Chaco"*, the *"Bolivian Army Order of Military Merit"*, the *"Medal for the Chaco Campaign"* and the *"Hero of Cañada Strongest Medal"*. (*Jorge Cornejo*)

Paraguayan Air Arm Caproni AP-1. (*Colonel Ret. Agustín Pasmor*)

ordered 60 new aircraft in Italy for the Paraguayan Air Arm and Naval Aviation. Franco was deposed in a *coup d'état* in 1937 and the new President, Dr Félix Paiva, tried to cancel the order, but the Italians convinced him to at least accept one third of the original order, so 20 aircraft were finally purchased: four *Breda Ba.25* primary trainers (one of them a *Ba.25Idro* for the Naval Aviation), two *Fiat C.R.30B* advanced trainers, five *Fiat C.R.32quater* fighters,

President Dr Félix Paiva (third from the left) with high civil and military authorities in front of a *Potez 25* bomber at Ñu-Guazú AFB on 26 July 1939. (*Instituto de Historia y Museo Militar del MDN*)



Naval Aviation *Macchi M-18A.R.* serial R-5 at Bahia Negra NAS in 1935. (*Tito Aranda*)

seven *Caproni-Bergamaschi Ca.307 AP-1* attack aircraft and two *Caproni Ca.309 Ghibli* for transport.

Once the Italian aircraft arrived, the Paraguayan Air Arm reorganised its units into a *training squadron* with the *Breda Ba.25*, *Fiat C.R.30*, the surviving *Consolidated Fleet-2* and the *Consolidated Model 21* (*PT-11*); a *transport squadron* with the *Caproni Ca.309 Ghibli,* the surviving *Breda Ba.44* and *Travel Air S6000B*; two fighter squadrons, the first with the *Fiat C.R.32* and the surviving *Fiat C.R.20bis*, and the second with the *Caproni AP-1*; and a *reconnaissance and bombing squadron* with the six surviving *Potez 25* bombers.

On 27 August 1936, many Paraguayan and foreign volunteer pilots were decorated with the *Chaco Cross* in a solemn ceremony at Ñu-Guazú AFB for their brilliant participation in the war. Later in the year, on 22 December, 56 pilots, gunners and NCOs received the *Defender Cross* for the same reason.

On 26 July 1939, the President of Paraguay, Dr Félix Pavia, pinned the *Chaco Cross* decoration to the Paraguayan Air Arm war flag that was hanging from the *Potez 25A.2* serial 5 propeller in a solemn ceremony at Ñ*u-Guazú* AFB. There were about 33 aircraft displayed, including the newly arrived Italian planes.

This picture taken in 1939 shows *Potez 25TOE* serial 7 painted in overall silver dope. The original gunner's cockpit was modified to carry two passengers – see the tiny windows. On 7 September 1940, the President of Paraguay, General José Félix Estigarribia, his wife, Julia Miranda Cueto de Estigarribia and the pilot, Major PAM Carmelo Peralta were killed when this noble biplane crashed near the city of Altos. (*Instituto de Historia y Museo Militar del MDN*)

Through the Presidential Decree Nr. 14,799 dated 28 September 1942, the Paraguayan Naval Aviation war flag also received the *Chaco Cross* decoration for its outstanding participation in the war against Bolivia. The solemn ceremony took place at *Sajonia naval air station* in Asunción in the presence of the President of Paraguay, General Higinio Morínigo.

CHAPTER 7

CONCLUSION

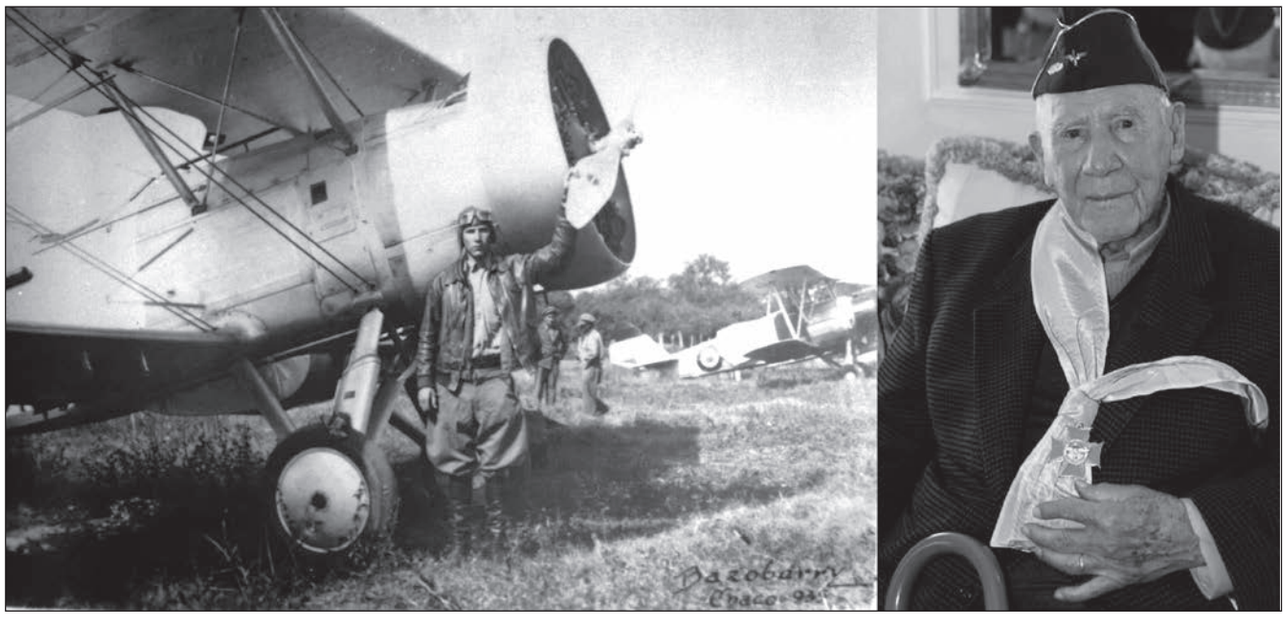
The Chaco air war can be considered the first 'modern' conflict in South America in the 20th century. The Paraguayan Army achieved conclusive victories that led to the recovery of almost the entire territory invaded by Bolivia. At the beginning of the war, Paraguay occupied only 110,700 square kilometres of the Chaco, but by the end, 136,225 square kilometres were conquered. Taking the historical claim that Paraguay's border with Bolivia was the Parapití and Otuquis rivers in the northwest, only 51,118 square kilometres of the Chaco territory were kept in Bolivian hands after the signature of the Peace and Border Treaty in 1938. Bolivia mobilised 250,000 troops for the war effort, suffered 52,397 casualties and had 21,000 soldiers were captured and kept as prisoners of war. Paraguay mobilised 140,000 troops, suffered 36,000 casualties and had only 2,500 prisoners kept in Bolivia. Bolivia spent a total of 228,660,000 dollars in the war against 124,503,515 in American money spent by Paraguay. The powerful Bolivian Military Air Arm could not prevent any mission of the Paraguayan Military Aviation, and if the following numbers are judged, it can be concluded that the war in the air, as well as the ones on the ground and rivers, were more favourable to Paraguay.

	Paraguay	**Bolivia**
Aircraft lost in air combat	2	2
Aircraft lost due to AA-fire	0	5
Aircraft lost in accidents	15	20
Total aircraft loss	17	27
Crew KIA	15	25

These numbers reflect the total loss of aircraft during the war (1932–35), not including the planes that were later repaired and returned to active service, and also the pre-war accidents. Many aircraft were cannibalised to keep the rest of the fleet in operation on both sides.

The only surviving plane of the Chaco War. This *Consolidated Fleet* was purchased in 1931 and received the serial E-15. It survived the war and in 1945 was transferred to *Líneas Aéreas de Transporte Nacional* (*LATN*) and registered as ZP-TAG, to be used as a mail plane. It was then sold to the *"Mbyyu'i" glider club* in 1953 and registered as ZP-EAL. It suffered a light accident in the early 1970s and was kept in storage for 20 years. Donated to the *Paraguayan Air Force* in 1990, it was rebuilt and is now in flying condition at the *"Yvytú" flight club*. (*Author*)

Second Lieutenant MAM Agustín Pasmor in 1932 and in 1997 as retired colonel. Born in Areguá in 1909, he graduated from the Military Aviation School in 1930. During the Chaco War, he was the maintenance chief of the Paraguayan Air Arm. In the 1940s he was appointed as the air traffic director and in the 1950s as civil aeronautics general director. He retired in 1960 with the rank of colonel. In his civil life, he was an aircraft accident investigator for decades. He passed away in 2007 in Asunción at the age of 98. (*Colonel MAM Ret. Agustín Pasmor*)



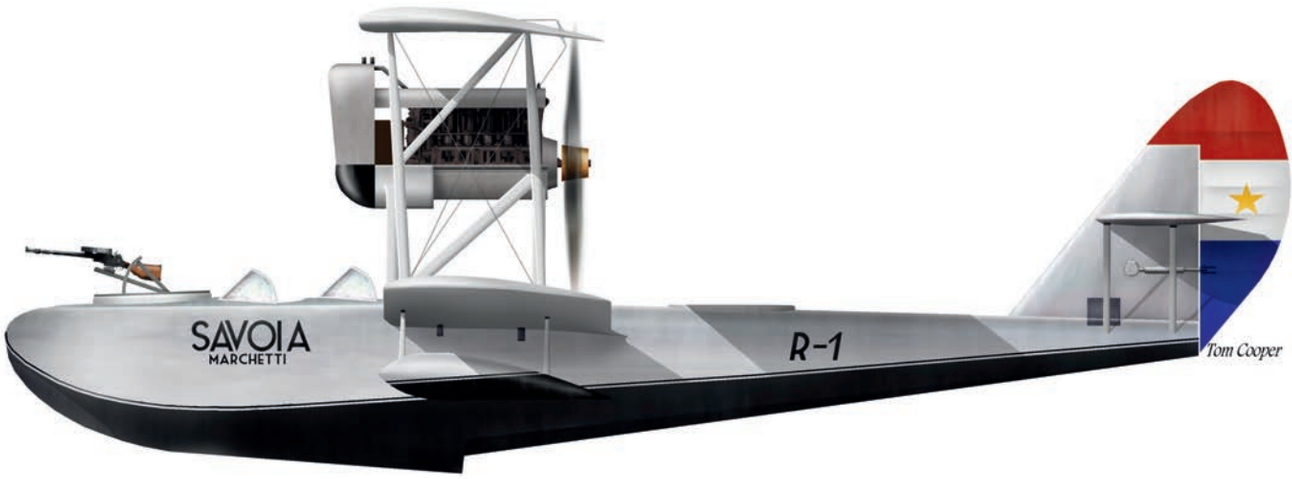
Lieutenant Alberto Paz Soldán Pol in 1934 and in 2011 as retired major general. He was born in Cochabamba in 1911, graduated from the army military school in 1932, fought in the Chaco War in the artillery first and then transferred to the military aviation in 1933 where he became a fighter pilot. He had a long career at the Bolivian Air Force, retiring in 1967. He passed away in 2014 in La Paz at the age of 102. (*Ramiro Molina Alanes*)

Paraguayan Air Arm *Potez 25A.2* of the First Reconnaissance and Bombing Squadron. (Artwork by Tom Cooper © Helion & Company)

Paraguayan Air Arm *Potez 25TOE* of the Second Reconnaissance and Bombing Squadron. (Artwork by Tom Cooper © Helion & Company)

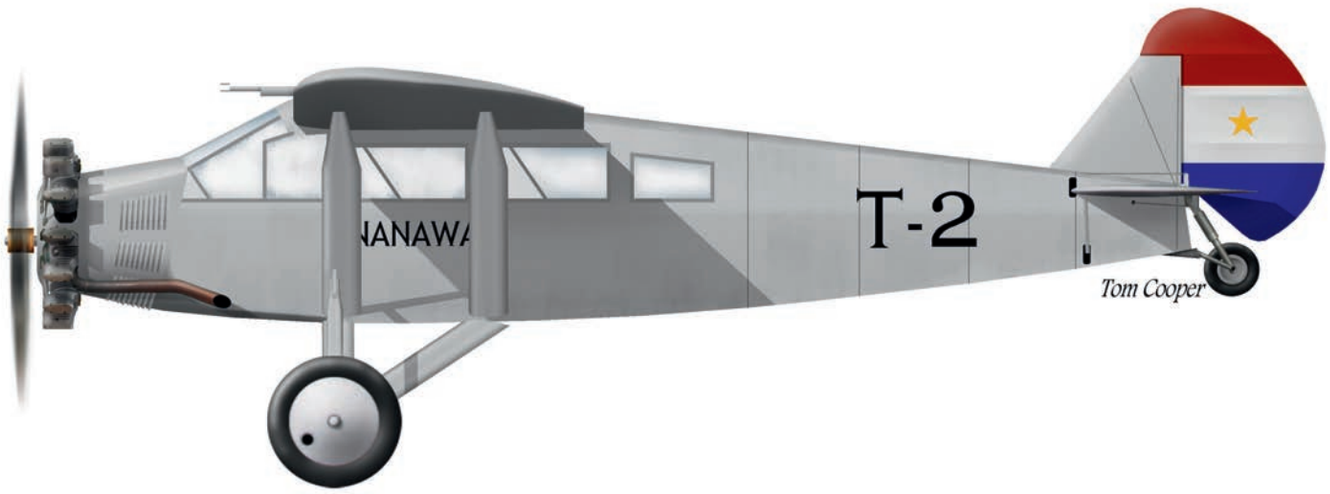
Paraguayan Air Arm *Wibault 73 C.1* of the First Fighter Squadron. (Artwork by Tom Cooper © Helion & Company)

Paraguayan Air Arm *Fiat C.R.20bis* of the 11th Fighter Squadron. (Artwork by Tom Cooper © Helion & Company)

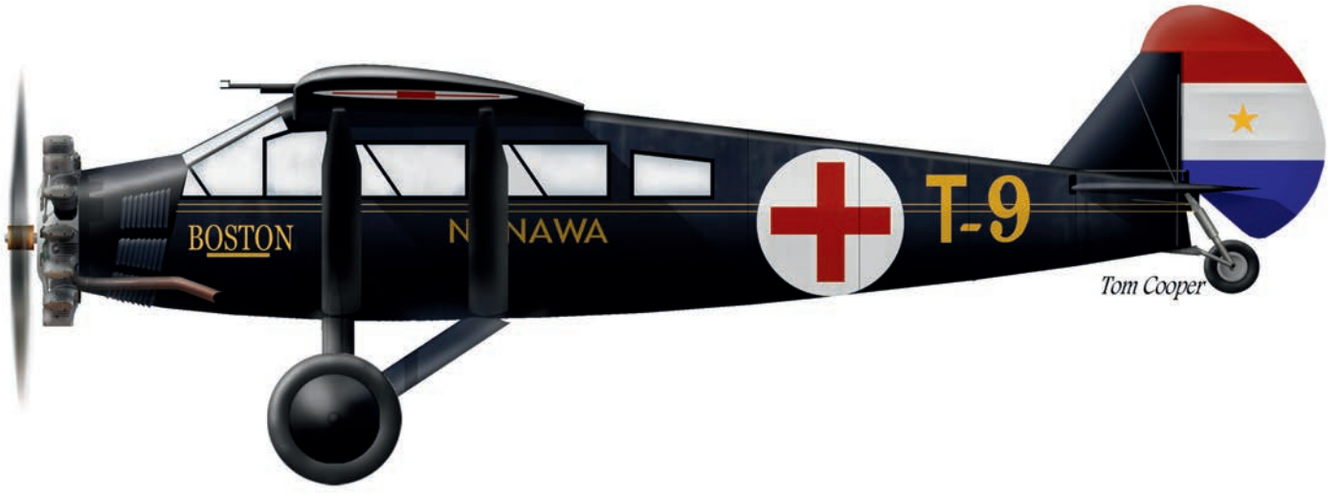


Paraguayan Naval Aviation *Savoia Marchetti S.59bis*. (Artwork by Tom Cooper © Helion & Company)

Paraguayan Naval Aviation *Macchi M-18A.R.* (Artwork by Tom Cooper © Helion & Company)



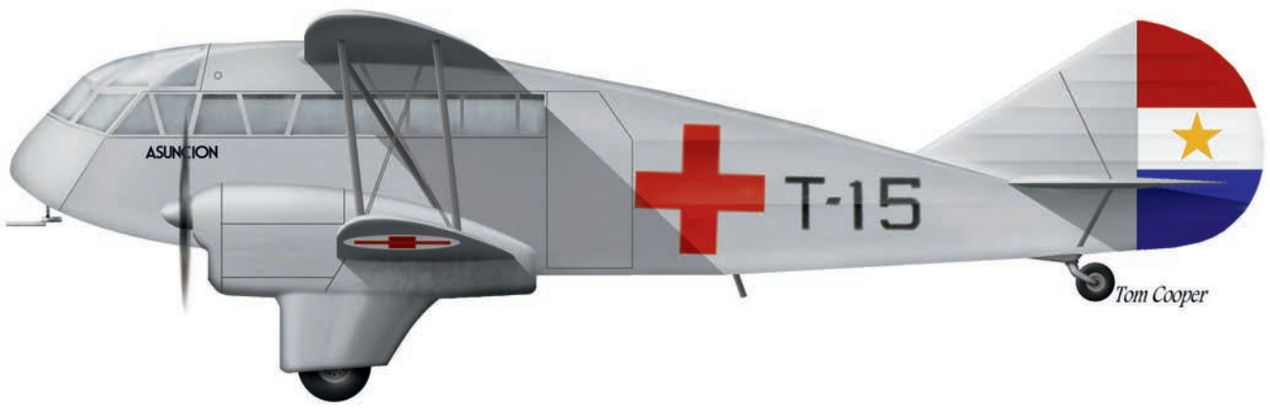
Paraguayan Air Arm *Travel Air S6000B* of the Transport Squadron. (Artwork by Tom Cooper © Helion & Company)



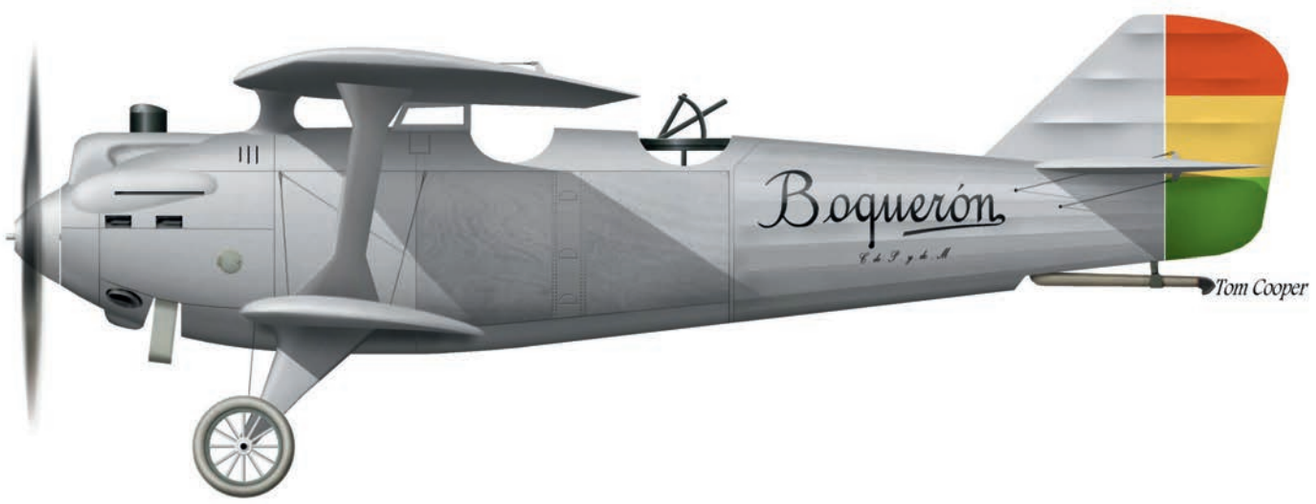
Paraguayan Air Arm *Travel Air S6000B* of the Transport Squadron. (Artwork by Tom Cooper © Helion & Company)

Paraguayan Air Arm *Junkers A.50fe* of the Transport Squadron. (Artwork by Tom Cooper © Helion & Company)

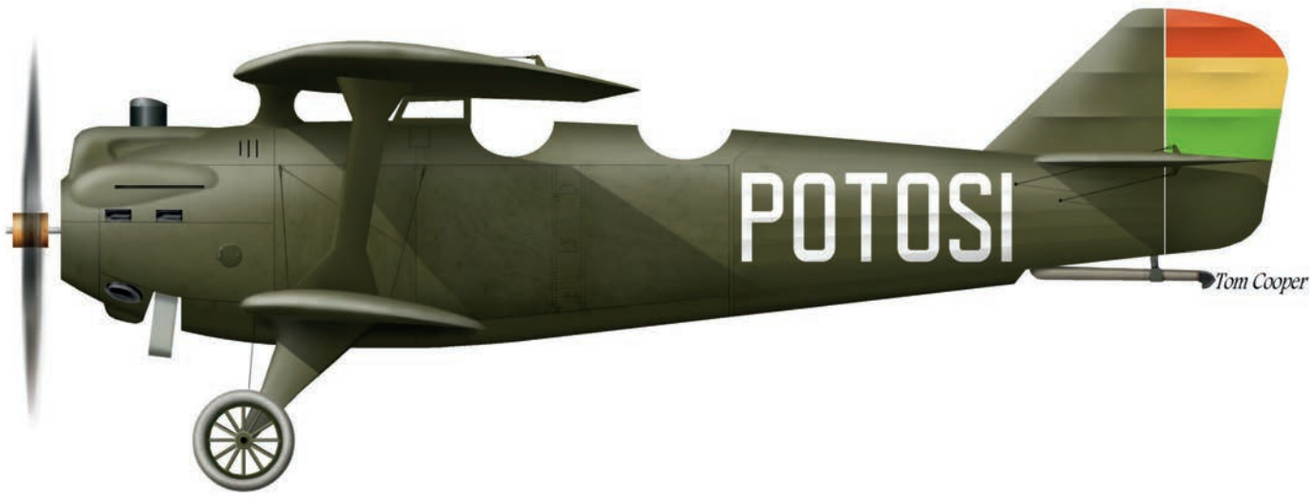
Paraguayan Air Arm *De Havilland DH-60M Gypsy Moth* of the Transport Squadron. (Artwork by Tom Cooper © Helion & Company)



Paraguayan Air Arm *Breda Ba.44* of the Transport Squadron. (Artwork by Tom Cooper © Helion & Company)

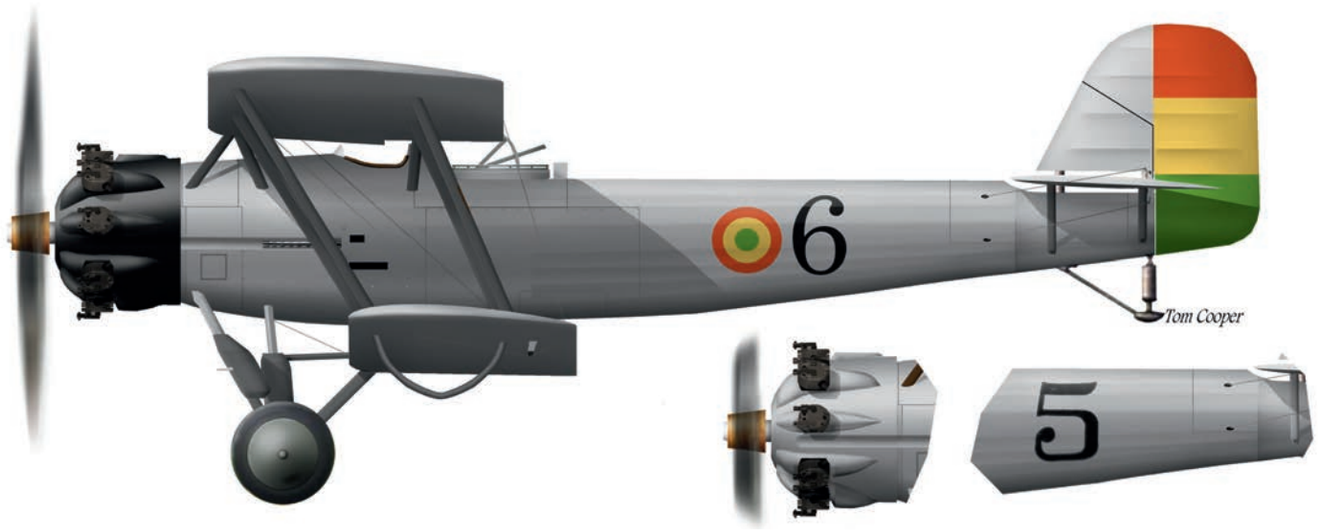


Bolivian Air Forces *Breguet XIX A.2.* (Artwork by Tom Cooper © Helion & Company)



Bolivian Air Forces *Breguet XIX A.2.* (Artwork by Tom Cooper © Helion & Company)

Bolivian Air Forces *Vickers Type 143 Bolivian Scout.* (Artwork by Tom Cooper © Helion & Company)



Bolivian Air Forces *Vickers Type 149 Vespa III.* (Artwork by Tom Cooper © Helion & Company)

Bolivian Air Forces *Curtiss-Wright CW-C14R Osprey.* (Artwork by Tom Cooper © Helion & Company)

Bolivian Air Forces *Curtiss-Wright Model 35A Hawk II*. (Artwork by Tom Cooper © Helion & Company)

Bolivian Air Forces *Curtiss-Wright Cyclone-Falcon.* (Artwork by Tom Cooper © Helion & Company)

Bolivian Air Forces *Junkers W.34ci.* (Artwork by Tom Cooper © Helion & Company)

Bolivian Air Forces *Junkers K.43.* (Artwork by Tom Cooper © Helion & Company)

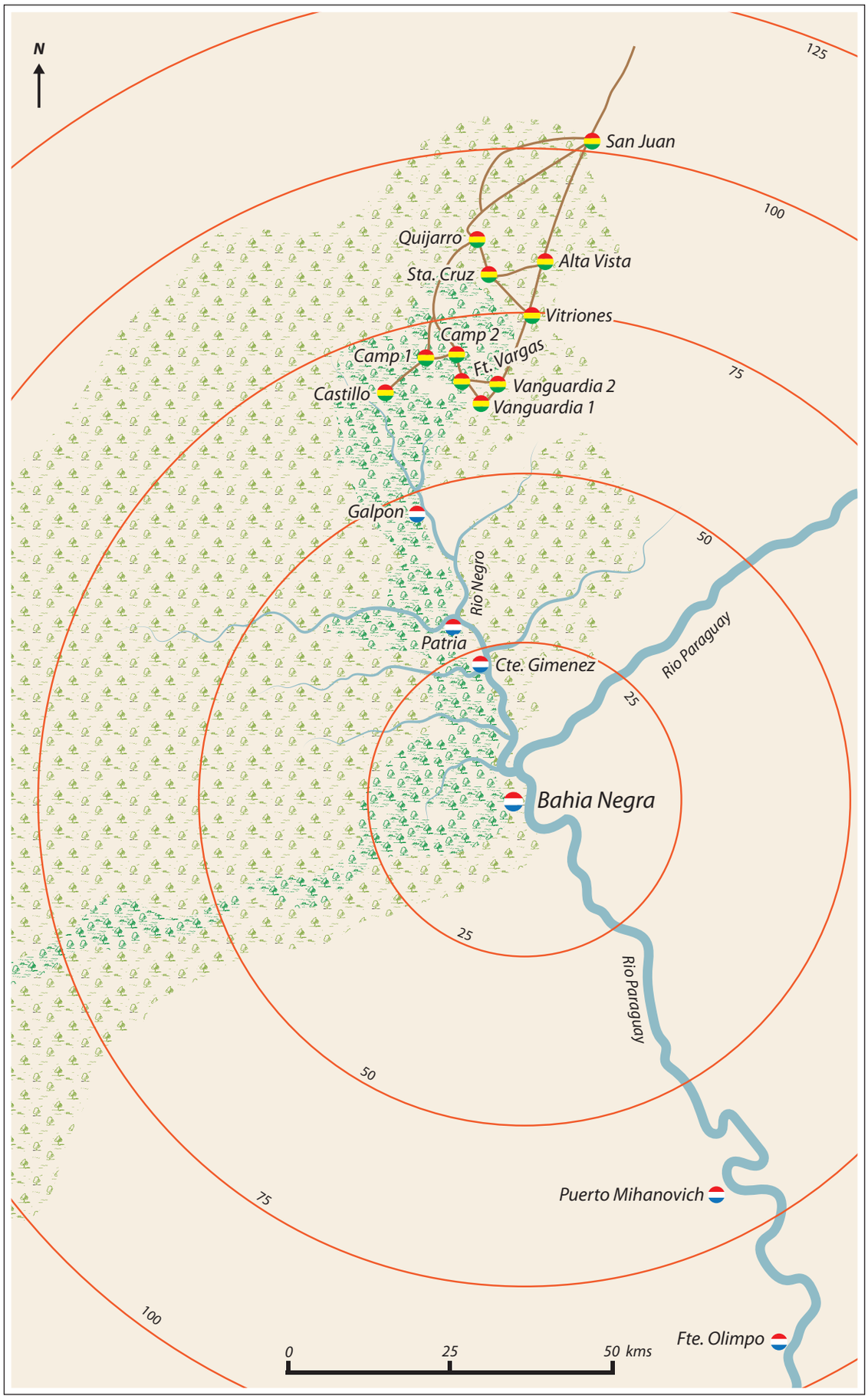
Bolivian Air Forces *Junkers Ju.52/3m.* (Artwork by Tom Cooper © Helion & Company)

The Theatre of War. (Map drawn by George Anderson © Helion & Company)

Bolivian and Paraguayan fortresses in the Chaco region at the beginning of the war. (Map drawn by George Anderson © Helion & Company)

The Grand Chaco, the disputed territory between Paraguay and Bolivia. (Map drawn by George Anderson © Helion & Company)

The Paraguayan Army offensive and the recapture of the entire Chaco. (Map drawn by George Anderson © Helion & Company)



Detailed map of the North Front drawn by Navy first lieutenants Ramón E. Martino and Ramón Diaz Benza after many recce flights over the area. (Map drawn by George Anderson © Helion & Company)

Recce flights carried out by the Paraguayan Air Arm during the Chaco War. (Map drawn by George Anderson © Helion & Company)

The Bolivian "*Escuela Militar de Aviación*" badge.
(*Alas de Bolivia* by Amalia Villa de la Tapia)

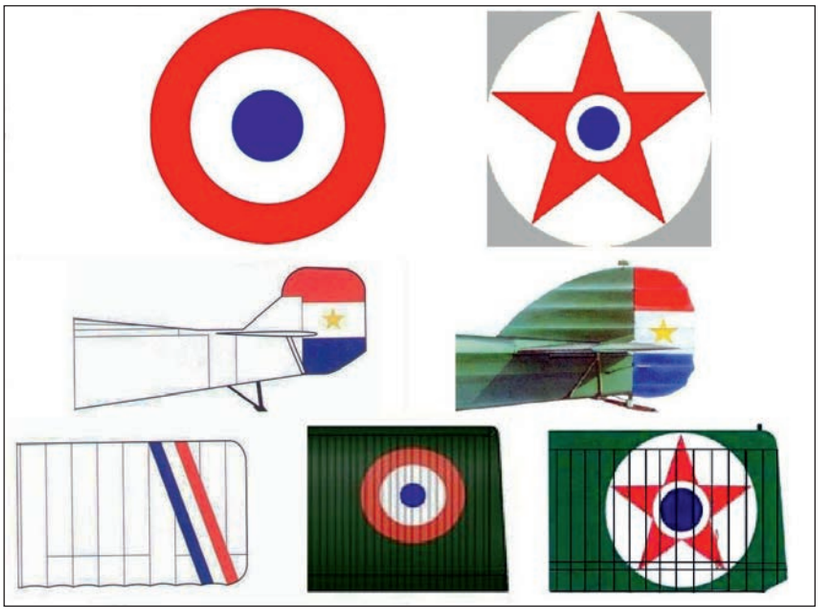
The "Fuerzas Aéreas" emblem used in the Chaco War.
(*Alas de Bolivia* by Amalia Villa de la Tapia)

Artistic view of Pabón's *Curtiss Osprey* serial 78 being shot down by *Potez 25TOE* serial 11. (Pablo de Cabo)

An artistic view of Captain Pabón's first and only aerial kill. (*Alas de Bolivi*a by Amalia Villa de la Tapia)

Artistic view of Martino's night raid over Vitriones. (Juan Moreno)

The three highest Paraguayan decorations, from left to right: the "*Cruz del Chaco*" (Chaco Cross), the "*Cruz del Defensor*" (The Defender's Cross) and the "*Medalla de Boquerón*" (Boquerón's Medal). (Author's files)



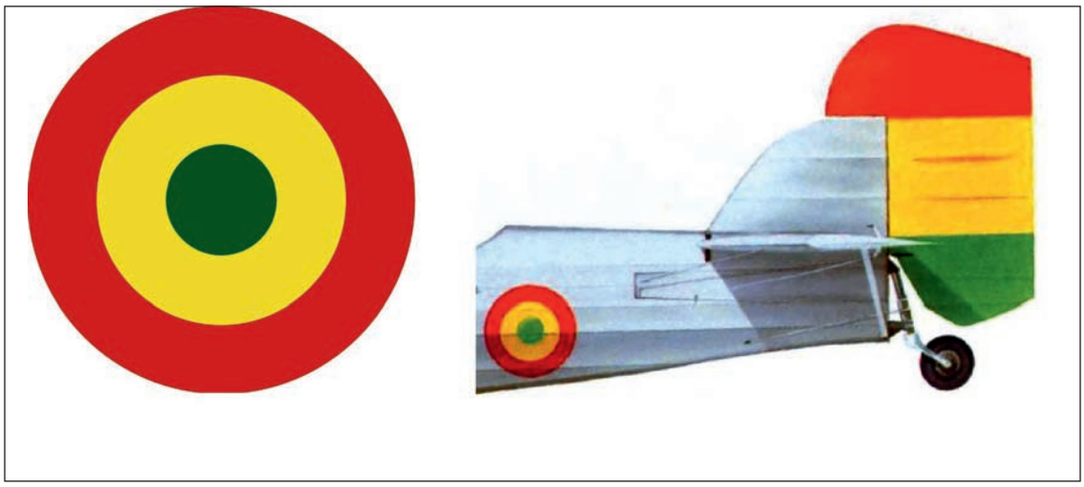
Paraguayan Air Arm roundel (left) and alternative star (right). National colours on the rudder with a yellow star on the white stripe (centre). Tricolour bands used in the Fiat C.R.20bis, the traditional and alternative roundels. (Author's collection)

Paraguayan Air Arm pilot and aircraft mechanic wings. (Author's files)

Paraguayan Naval Aviation pilot wings.

Bolivian Military Aviation pilot wings

Bolivian "*Fuerzas Aéreas*" badge.



Bolivian roundel and the colours of the national flag on the rudder.

APPENDIX I

RECCE FLIGHTS CARRIED OUT BY THE PARAGUAYAN AIR ARM DURING THE CHACO WAR

From	To	Distance (km)
Asunción	Concepción	210
Asunción	Cabeza de Tigre	285
Asunción	Bahía Negra	520
Concepción	Orihuela	142
Concepción	Puerto Pinasco	100
Concepción	Nanawa	254
Concepción	Puerto Sastre	173
Concepción	Casado	145
Concepción	Bahía Negra	218
Puerto Casado	Isla Poí	190
Isla Poi	Cabeza de Tigre	100
Isla Poi	Nanawa	110
Isla Poi	Samaklay	110
Isla Poi	Saavedra	115
Isla Poi	Arce	60
Isla Poi	Boquerón	37
Isla Poi	Muñoz	148
Isla Poi	Corrales	87
Isla Poi	Toledo	65
Isla Poi	Camacho	110
Camacho	Ballivián	178
Camacho	Oruro	188
Camacho	Capiirendá	348
Camacho	Ybamirante	295
Camacho	Yrendagué	220
Camacho	Picuiba	198
Camacho	Ingavi	235
Camacho	Madrejón	173
Ybamirante	Carandayty	20
Ybamirante	Macharetí	45
Ybamirante	Cuevo	66
Ybamirante	Boiyubé	33
Ybamirante	Charagua	89
Bahía Negra	Chovoreca	140
Bahía Negra	Vanguardia	70

APPENDIX II

CHACO WAR AIRCRAFT FLEETS

Paraguayan Air Arm

Type	c/n	Previous identity	Serial	Delivered	wfu
Hanriot HD.32	525	New	E-1	1927	1932
Hanriot HD.32	526	New	E-2	1927	1932
Hanriot HD.32	527	New	E-3	1927	1932
Morane-Saulnier M.S.35	?	New	E-4	1927	1936
Morane-Saulnier M.S.139	?	New	E-5	1927	1936
Consolidated Fleet 2	?	R-?	E-7	1931	1945
Consolidated Fleet 2	?	R-?	E-9	1931	1945
Consolidated Fleet 2	?	R-?	E-11	1931	w/o 1935
Consolidated Fleet 2	?	R-?	E-13	1931	w/o 1940
Consolidated Fleet 2	?	R-?	E-15	1931	1945
S.A.M.L. A.3	?	?	MET-1	1923	1935
S.A.M.L. A.3	?	?	MET-2	1923	w/o 1929
Ansaldo SVA-10	?	?	1	1923	1932
Ansaldo SVA-5	?	?	2	1923	1932
S.P.A.D.-Herbemont S.XX	?	?	–	1923	1924
Potez 25 A.2	?	New	1	1928	1933
Potez 25 A.2	?	New	2	1928	1929
Potez 25 A.2	?	New	3	1928	1933
Potez 25 A.2	?	New	4	1928	1933
Potez 25 A.2	?	New	5 / R-5	1928	1940
Potez 25 A.2	?	New	6	1928	w/o 1932
Potez 25 A.2	?	New	7	1928	w/o 1928
Potez 25 TOE	?	New	7 / R-7	1932	w/o 1940
Potez 25 TOE	?	New	8 / 15 / R-15	1932	1940
Potez 25 TOE	?	New	9 / R-9	1932	1940
Potez 25 TOE	?	New	10	1932	w/o 1934
Potez 25 TOE	?	New	11 / R-11	1932	1943
Potez 25 TOE	?	New	12 / R-12	1932	1940
Potez 25 TOE	?	New	13	1932	w/o 1934
Potez 25 TOE	?	New	14	1932	w/o 1933
Savoia S.52	3	New	16	1927	w/o 1933
Curtiss D.12 Falcon	1994	New	17	1932	1936
Wibault 73 C.1	?	New	1	1929	w/o 1932
Wibault 73 C.1	?	New	2	1929	w/o 1932
Wibault 73 C.1	?	New	3 / 23	1929	1935
Wibault 73 C.1	?	New	4	1929	w/o 1931
Wibault 73 C.1	?	New	5	1929	1935
Wibault 73 C.1	?	New	6	1929	1935
Wibault 73 C.1	?	New	7	1929	1935
Fiat C.R.20bis	429	New	11.1	1933	w/o 1933
Fiat C.R.20bis	430	New	11.3 / C-1	1933	1940
Fiat C.R.20bis	431	New	11.5 / C-2	1933	w/o 1939

Fiat C.R.20bis	432	New	11.7	1933	w/o 1934
Fiat C.R.20bis	433	New	11.9	1933	w/o 1933
De Havilland DH-60M Gypsy Moth	1415	R-142	T-1	1932	w/o 1933
Breda Ba.44	4302	New	T-1 / T-15	1933	1945
Travel Air S6000B	6B-2011	NC624K	T-2	1933	1945
Junkers A.50fe Junior	4353	R-190 / R-ACJB	T-3	1932	w/o 1933
De Havilland DH-60G Gypsy Moth	?	R-123	T-4	1932	1936
Junkers A.50fe Junior	3564	R-191 / R-ACJC	T-5	1932	1935
Travel Air S6000B	6B-1029	NC9815	T-5 / T-9	1933	1945
CANT 26	?	R-183	T-6	1932	w/o 1933
Curtiss Robin C	272	NC8399	T-7	1933	1938
Breda 15S	1418	I-AAUG	T-8	1930	w/o 1933
Consolidated Model 21C	14	New	T-11	1933	1943
Waco C	?	R-?	T-13	1933	w/o 1933

Paraguayan Naval Aviation

Type	c/n	Previous Identity	Serial	Delivered	wfu
SavoiaMarchetti S.59bis	2275	R-ACTZ	R-1	1929	1943
CANT 10ter	10	I-OLTL / R-ACVW	H-1	1929	1933
Macchi M-18A.R.	3804	New	R-3	1932	w/o 1935
Macchi M-18A.R.	3805	New	R-5	1932	1947

Bolivian Military Aviation

Type	c/n	Serial	Delivered	wfu
Morane-Saulnier M.S. 35	?	1	1923	?
Morane-Saulnier M.S. 35	?	2	1923	?
Morane-Saulnier M.S. 35	?	3	1923	?
Morane-Saulnier M.S. 35	?	4	1923	?
Morane-Saulnier G Pinguino	?	–	1923	?
Morane-Saulnier G Pinguino	?	–	1923	?
Caudron C.97	?	Illampu	1925	w/o 1926
Caudron C.97	?	Chorolque / Cap. Valle	1925	1934
Caudron C.97	?	Sajama	1925	1932
Caudron C.97	?	Sgto. Flores / Oruro I	1925	1932
VickersType 155 Vendace III	?	1	1929	w/o 1931
Vickers Type 155 Vendace III	?	2	1929	w/o 1933
Vickers Type 155 Vendace III	?	3	1929	1933
Junkers A.50fe Junior	?	Acre	1930	w/o 1933
Junkers A.50fe Junior	?	Piray	1930	1935
Junkers A.50fe Junior	?	Warnes	1930	1935
Curtiss-Wright CW-16E Trainer	?	1	1934	1944
Curtiss-Wright CW-16E Trainer	?	2	1934	1944
Curtiss-Wright CW-16E Trainer	?	3	1934	w/o 1934
Fokker CVb	4874	Fokker 1	1925	1932
Fokker CVb	4875	Fokker 2	1925	1932
Fokker CVb	4876	Bolivia	1925	1932
Fokker CVb	4877	Mcal. Sucre	1925	w/o 1928
Fokker CVb	4878	Sgto. Max Paredes	1925	1932

De Havilland Airco DH-9	?	AM-1	1925	1932
De Havilland Airco DH-9	?	AM-2	1925	1932
Breguet XIX A.2	?	La Paz	1924	?
Breguet XIX A.2	?	Potosi	1925	?
Breguet XIX A.2	?	Oruro	1926	?
Breguet XIX A.2	?	Uncía	1926	?
Breguet XIX A.2	?	Batallón Colorados	1928	?
Breguet XIX A.2	?	Ingavi	1928	?
Breguet XIX A.2	?	Boquerón	1928	?
Vickers Type 149 Vespa III	?	1	1929	1935
Vickers Type 149 Vespa III	?	2	1929	1935
Vickers Type 149 Vespa III	?	3	1929	w/o 1930
Vickers Type 149 Vespa III	?	4	1929	1935
Vickers Type 149 Vespa III	?	5	1929	w/o 1932
Vickers Type 149 Vespa III	?	6	1929	w/o 1933
Vickers Type 149 Vespa III	?	18	1929	1935
Vickers Type 149 Vespa III	?	23	1929	w/o 1934
Vickers Type 149 Vespa III	?	44	1929	1935
Curtiss-Wright Cyclone Falcon	11815/F-SF-17	201	1934	?
Curtiss-Wright Cyclone Falcon	11816/F-SF-18	202	1934	?
Curtiss-Wright Cyclone Falcon	11817/F-SF-19	203	1934	?
Curtiss-Wright Cyclone Falcon	11818/F-SF-20	204	1934	?
Curtiss-Wright Cyclone Falcon	11819/F-SF-21	205	1934	?
Curtiss-Wright Cyclone Falcon	11820/F-SF-22	206	1934	?
Curtiss-Wright Cyclone Falcon	11821/F-SF-23	207	1934	w/o 1935
Curtiss-Wright Cyclone Falcon	11822/S-SF-24	208	1934	?
Curtiss-Wright Cyclone Falcon	11823/S-SF-25	209	1934	w/o 1935
Vickers Type 143 Scout	?	7	1929	1935
Vickers Type 143 Scout	?	8	1929	1935
Vickers Type 143 Scout	?	9	1929	w/o 1932
Vickers Type 143 Scout	?	10	1929	1935
Vickers Type 143 Scout	?	11	1929	1935
Vickers Type 143 Scout	?	12	1929	1935
Vickers Type 143 Scout	?	54	1929	w/o 1935
Vickers Type 143 Scout	?	59	1929	w/o 1935
Vickers Type 143 Scout	?	96	1929	w/o 1934
Curtiss Model 35A Hawk II	11659/H23	30	1932	w/o 1934
Curtiss Model 35A Hawk II	11660/H24	32 / 48	1932	?
Curtiss Model 35A Hawk II	11661/H25	34	1932	?
Curtiss Model 35A Hawk II	11662/H26	36	1932	?
Curtiss Model 35A Hawk II	11767/H46	–	Seized?	-
Curtiss Model 35A Hawk II	11768/H64	38	1932	?
Curtiss Model 35A Hawk II	11769/H65	40	1932	?
Curtiss Model 65 Sea Hawk II	11824/SH27	42	1932	?
Curtiss Model 65 Sea Hawk II	11825/SH28	–	Seized	–
Curtiss Model 65 Sea Hawk II	11826/SH29	–	Seized	–
Curtiss Model 35A Hawk II	11844/H82	44	1932	?
Curtiss Model 35A Hawk II	11845/H83	46	1932	?
Curtiss CW-C14R Osprey	?	11	1933	?

Curtiss CW-C14R Osprey	?	13	1933	?
Curtiss CW-C14R Osprey	?	20	1933	?
Curtiss CW-C14R Osprey	?	22	1933	?
Curtiss CW-C14R Osprey	?	25	1933	?
Curtiss CW-C14R Osprey	?	30	1933	w/o 1934
Curtiss CW-C14R Osprey	?	39	1933	?
Curtiss CW-C14R Osprey	?	45	1933	?
Curtiss CW-C14R Osprey	?	50	1933	?
Curtiss CW-C14R Osprey	?	60	1933	?
Curtiss CW-C14R Osprey	?	62	1933	?
Curtiss CW-C14R Osprey	?	64	1933	?
Curtiss CW-C14R Osprey	?	68	1933	?
Curtiss CW-C14R Osprey	?	78	1933	w/o 1934
Curtiss CW-C14R Osprey	?	87	1933	?
Curtiss CW-C14R Osprey	?	91	1933	?
Curtiss CW-C14R Osprey	?	93	1933	?
Curtiss CW-C14R Osprey	?	95	1933	?
Curtiss CW-C14R Osprey	?	–	1933	w/o 1933
Curtiss CW-C14R Osprey	?	–	1933	w/o 1933
Junkers K.43	?	101	1934	w/o 1934
Junkers K.43	2755	102 / Sajama	1934	w/o 1937
Junkers K.43	2756	103 / Mururata	1934	w/o 1939
Junkers F-13L	769?	El Oriente	1925	w/o 1926
Junkers F-13L	?	Oriente II	1927	w/o 1929
Junkers F-13L/W	?	Beni	1926	w/o 1926
Junkers F-13L	711?	Ex D-322 / Beni II	1928	w/o 1930
Junkers F-13L	788	Ex R-ACTW / Beni III	1930	1942
Junkers F-13L	?	Charcas	1926	w/o 1934
Junkers F-13L	?	Illimani	1928	1935
Junkers F-13L/W	634	Ex D-218 / Ex R-ACTA / Mamore	1928	1935
Junkers F-13L/W	?	Chaco	1928	w/o 1928
Junkers W.34ci	2607	Vanguardia	1929	w/o 1939
Junkers W.34ci	2608	Tunari	1930	1935
Junkers W.34ci	2609	PresidenteSiles	1930	w/o 1935
Junkers Ju.52/3m	4008	Juan del Valle	1932	w/o 1940
Junkers Ju.52/3m	4009	Huanuni	1932	w/o 1937
Junkers Ju.52/3m	4018	Chorolque	1932	w/o 1936
Junkers Ju.52/3m	4061	Bolivar	1935	1943
Ford 5-AT-D Trimotor	5-AT-113	Ex NC9654 / Cruz del Sur	1932	w/o 1932
Sikorsky S.38BL	114-15	Ex NC24V / Nicolas Suarez	1933	w/o 1941
Sikorsky S.38B	114-11	Ex NC9138 / Marihui	1935	w/o 1935
Curtiss-Wright BT-32 Condor	59	Ex NC11729, NR11729	Seized	–
Curtiss-Wright AT-32C Condor	60	Ex NR11730	Seized	–
Curtiss-Wright AT-32C Condor	61	Ex NR11731	Seized	–
Curtiss-Wright AT-32C Condor	62	Ex NR11732	Seized	–

All Bolivian aircraft were purchased new from the factory with the exception of some *Junkers F-13*, the *Ford 5-AT-D*, the *Sikorsky S.38Bs* and the *Condor* bombers.

SOURCES

A. Files

Author's personal files.
Bolivian Air Force.
Brigadier General (Ret.) José Atilio Migone's war diary.
Carlos Alberto Pusineri Scala, Paraguayan historian.
Colonel MAM (Ret.) Agustín Pasmor's files and war diary.
Colonel DEM (Ret.) Pablo Stagni's war diary.
First Lieutenant PAM (Ret.) Homero Duarte's war diary.
First Lieutenant PAM (Ret.) Emilio Rocholl.
First Lieutenant PAM (Ret.) Hermes Gómez Lezcano.
Lieutenant Commander (Ret.) PAM Víctor Urbieta Rojas' war diary.
Lieutenant Colonel PAM Carmelo Peralta.
Museum of Military History, Ministry of National Defense.
Paraguayan Air Force.
Paraguayan Navy and Naval Aviation.
Rear Admiral (Ret.) PAN Ramón E. Martino's war diary.

B. Interviews

Captain PAM (Ret) Abdón Álvarez Albert, ex *Fiat C.R.20bis* pilot.
Colonel MAM (Ret.) Agustín Pasmor, ex maintenance chief of the Paraguayan Air Arm during the Chaco War.
Colonel PAM (Ret.) Enrique Déntice, ex *Potez 25* pilot.
First Lieutnant PAM (Ret) Homero Duarte, ex *Potez 25* pilot.
First Lieutenant (Ret.) Gonzalo Palau, ex photographer, aerial observer and gunner.
Sergeant Tec. Ramiro Molina Alanes, archives chief of the Bolivian Air Force.

C. Books and articles

Alfredo Seiferheld, *Economía y Petróleo durante la Guerra del Chaco.* (Editorial El Lector. Asunción, 1983).
Ángel Rios, *La Defensa del Chaco, verdades y mentiras de una victoria.* (Editorial Ayacucho. Buenos Aires, 1950).
Antonio Luis Sapienza Fracchia, *La Contribución Italiana en la Aviación Paraguaya*. (Author's edition. Asunción, 2007).
Antonio Luis Sapienza Fracchia, *Historia Gráfica de la Fuerza Aérea Paraguaya, 1913-2013.* (Fuerza Aérea Paraguaya. Luque, 2013).
Antonio Luis Sapienza Fracchia, *Agustín Pasmor. Un gran héroe Aeronáutico Paraguayo.* (Creamost S.A. Asunción, 2016).
Arma Aérea Paraguaya, *Reglamento de diplomas, brevets, banderines, insignias y distintivos.* (Base Aérea de Ñu-Guazú. Luque, 1942).
Capitán David H. Zook, *La Conducción de la Guerra del Chaco.* (Editorial Lito. Buenos Aires, 1962).
Capitán de Navio (S.R.) Ing. Naval PAN José Bozzano, *Reminiscencias*. (Casa Editorial Toledo. Asunción, 1962.
Capitán de Navio (SR) Agustín Rojas Gonzalez, *Algo sobre la Contribución Logística de la Armada Nacional en la Guerra del Chaco.* (Imprenta Militar. Asunción, 1985).
Capitán PAM (Rva.) Abdón Alvarez Albert, *Con las llamas en el aire.* (Imprenta Militar. Asunción, 1979).
Capitán PAM (SR) Félix Zarate Monges, *La Aviación Paraguaya antes y durante la Guerra del Chaco.* (Offset Leguizamón. Asunción, 1988).
Coronel DEM (SR) Luis Vittone, Álbum Héroes del Chaco. Volumes 1 & 2. (Diario Última Hora. Asunción, 1983).
Coronel DEM (SR) Pablo Stagni, *El Ejército y la Historia.* Volume 1. (Imprenta Militar. Asunción, 1986).
Coronel MAM (S.R.) Agustín Pasmor, *Creación de la Aeronáutica Militar Paraguaya.* Revista Trinchera. (Asunción, 1975).
Coronel MAM (S.R.) Agustín Pasmor, *Orígen, Organización y Desarrollo de la Actividad Aeronáutica en el Paraguay.* Revista Trinchera. (Asunción, 1985).
Comando en Jefe de las FF.AA. de la Nación, *Los Partes del Conductor. Comunicados Oficiales sobre la Guerra del Chaco*. (Sección Historia e Imprenta. Imprenta Militar. Asunción, 1950).
Daniel Hagedorn & Antonio Luis Sapienza, *Aircraft of the Chaco War, 1928-1935.* (Schiffer Publishing Ltd. Atglen, Penn. USA, 1996).
Daniel Hagedorn & Francis H. Dean, *Curtiss Fighter Aircraft. A Photographic History, 1917-1948.* (Schiffer Publishing Ltd. Atglen, Penn. USA, 2007).
General de División Aeronáutica (SP) Alberto Paz Soldan Pol, *Conducción de la Fuerza Aérea Boliviana en la Guerra del Chaco*. (Editorial Aeronáutica. La Paz, 1990).
Günter G. Endres, *Lloyd Aéreo Boliviano. Part 1: Bolivia's national airline, the pioneering years.* Airline History No. 61. Air Pictorial. (HPC Publishing. East Sussex, April 1983).
Julián del Rosario Escobar Aquino, *Los Cañoneros Paraguay y Humaitá.* (Imprenta Omega. Asunción, 2009).
Lorenzo N. Livieres Guggiari, *El financiamiento de la Defensa del Chaco, 1924-1935.* (Arte Nuevo Editores. Asunción, 1983).
Lloyd Aéreo Boliviano, *25 Años al servicio de Bolivia, 1925-15 de Septiembre-1950.* (La Paz, 1950).
Mariano Baptista Gumucio, *Historia Gráfica de la Guerra del Chaco.* (Editorial Khana Cruz SRL, La Paz, 1982).
Mariano Luis Lara Castro, *La preparación de la Defensa Nacional y la conducción militar y diplomática de la Guerra del Chaco.* Historia Paraguaya. Anuario de la Academia Paraguaya de la Historia. (Volume XIX. Asunción, 1982).
Mario Carrasco Solís, *Historia del LAB, 1925-1985.* (Editorial Universo Ltda. La Paz, 1985).
Mark Christie Wörner, *Aviones Junkers en Bolivia, 1925-1941. Crónica.* (Talleres Gráficos Kipus. Cochabamba, 2014).
Mayor PAM (SR) Leandro Aponte, *Cincuenta Años de Aeronáutica en el Paraguay.* (Editorial El Arte S.A. Asunción, 1957).
Mayor PAM (SR) Leandro Aponte, *La Aviación Paraguaya durante la Guerra del Chaco*. (Imprenta Militar. Asunción, 1986).
Mayor PAM (S.R.) Raúl Sosa Valdez, *Acciones de la Aviación en Campaña en la Guerra del Chaco.* (Revista Trinchera. Asunción, 1975).

Miguel Ángel Duarte Barrios, *Semblanza de un héroe: Contralmirante* (*SR*) *Ramón E. Martino.* (Author's edition. Asunción, 1983).
Pa*LAB*ras, *80 Años. Revista a Bordo del Lloyd Aéreo Boliviano.* (Editorial Palo Santo S.A. Asunción, Septiembre-Octubre 2005).
Pbro. H. Fernández Naranjo, *La Vida Fulgurante de Pabón*. (Editorial Aeronáutica. La Paz, 1987).
Pedro Troche, *Alma de Pájaro. La vida de Luis Tuya, aviador uruguayo en las Guerras del Chaco y Civil Española.* (Gráfica Natural S.A. Montevideo, 2012).
Ramiro Molina Alanes, *Los trimotores Junkers en la Aviación Boliviana*. Revista Actualidad Aeronáutica. Número 55. (Fuerza Aérea Boliviana. La Paz, 1988).
Ramiro Molina Alanes, *Vuelos sin retorno.* Revista Actualidad Aeronáutica. Número 44. (Fuerza Aérea Boliviana. La Paz, 1985).
Roberto Gentilli, *L'Aviazione da caccia italiana, 1918-1939.* Volume II: Tecnica, Stemmi, Esportazioni. (Edizioni Aeronautische Italiana S.R.L. Firenze, 1982).
Roberto Querejazu Calvo, *Masamaklay. Historia política, diplomática y militar de la Guerra del Chaco.* 5a Edición. (Librería Editorial GUM. La Paz, 2008).
Teniente Coronel de Aviación Amalia Villa de la Tapia, *Alas de Bolivia*. Volumes 1, 2 & 3. (Editorial Aeronáutica. La Paz, 1974, 1976 & 1983).
Teniente Coronel (S.R.) Antonio E. Gonzalez, *Preparación del Paraguay para la Guerra del Chaco.* Volumes 1 & 2. (Editorial El Gráfico S.A. Asunción, 1957).
Tomás de los Santos, *La Revolución de 1922.* Volumes 1 & 2. (Editorial El Lector. Asunción, 1984).

Acknowledgments

The author is deeply thankful to the late Colonel MAM (Ret.) Agustin Pasmor, Colonel PAM (Ret.) Enrique Déntice, Captain PAM (Ret.) Abdón Álvarez Albert, First Lieutenant PAM (Ret.) Homero Duarte and Second Lieutenant (Ret.) Gonzalo Palau. Likewise, Adrián J. English, Dr Hermes Gómez Ginard, Tito Aranda, David Demestri, Carlos Alberto Pusineri Scala, Ramiro Molina Alanes (FAB), Jorge Cornejo, Luis Rea Romero, Rodrigo Rosa, Víctor Meden, Juan Moreno, Pablo de Cabo, *Fuerza Aérea Paraguaya* (FAP), *Fuerza Aérea Boliviana* (FAB), *Aviación Naval Paraguaya* (ANP), *Instituto de Historia y Museo Militar del Ministerio de Defensa Nacional* (MDN), *Armada Paraguaya* and *Museo de Historia Aeronáutica del Uruguay*, among others, for the invaluable help.

About the author

Antonio Luis Sapienza Fracchia was born in Asunción, Paraguay on 14 May 1960. He graduated from the *Catholic University of Asunción* where he got a BA in Clinical Psychology. He also took specialised English courses at *Tulane University* of New Orleans, Louisiana, US and *San Diego State University* in California. He is an English teacher and one of the academic coordinators at the *Centro Cultural Paraguayo-Americano (CCPA)*, a binational institute in Asunción. Married with two children, he resides in the capital.

He is an aviation historian and a founding member of the *Instituto Paraguayo de Historia Aeronáutica "Silvio Pettirossi"*. He is also a corresponding member of similar institutes and academies in Argentina, Bolivia, Chile, Colombia, Spain, the US and Uruguay. He has written more than 500 articles for specialist magazines and websites on Paraguayan aviation history, and has given numerous lectures in schools, universities, institutes, and military and civil institutions in Paraguay and abroad. Since 2010, he has been an aviation history professor in the Paraguayan Air Force.

He has published nine books:

- *Aircraft of the Chaco War, 1928-1935*, with Daniel P. Hagedorn, in the US (1996).
- *Potez 25,* with several aviation historians, in France (1996).
- *Pioneros de la Aviación Iberoamericana,* with several aviation historians, in Spain (1999).
- *La Historia de Líneas Aéreas Paraguayas (LAP),* in Paraguay (2004).
- *La Contribución Italiana en la Aviación Paraguaya*, in Paraguay (2007).
- *Silvio Pettirossi. El Rey del Aire,* in Paraguay (2011).
- *El Pájaro Verde. Cien años del primer vuelo en Paraguay*, with Luis Verón, in Paraguay (2012).
- *Fuerza Aérea Paraguaya, Historia Ilustrada, 1913-2013,* in Paraguay (2013).
- *Agustín Pasmor. Un gran héroe aeronáutico del Paraguay*, in Paraguay (2016).

He received five decorations for his academic merits:

- The *Orden al Mérito Newberiano* given by the *Instituto Argentino de Historia Aeronáutica* in 1995.
- The *Cruz Newberiana Académica* by the *Instituto Nacional Newberiano* of Argentina in 1998.
- The *Orden al Mérito Santos Dumont* by the *Força Aérea Brasileira* in 2003.
- The *Medalla de la Aeronáutica* by the *Fuerza Aérea Paraguaya* in 2003.
- The medal *Dinac Honor al Mérito* by the *Dirección Nacional de Aeronáutica Civil* in 2010.

LATIN AMERICA @ WAR SERIES

Unravelling the mysteries and complexities of 20th century Latin American conflict

The Chaco War was probably the first "modern" conflict in Latin America where military aviation was widely used in all roles. Bolivia, as the reader will find out, had a very powerful military air force, but unfortunately for them and luckily for Paraguay, its high army command did not take advantage of it. On the other hand, the Paraguayan Commander-in-Chief, General José Félix Estigarribia used military aviation to help him defeat the enemy on the ground, and the result was clear: the Bolivians were expelled from the Chaco after three years of war.

Previous publications have focused on the Chaco Air War with the aircraft technical details and almost no information on aerial operations, which is this book's centrepiece. All dogfights and bombing missions mentioned are detailed including crews, aircraft, serials, places and outcomes. The book also describes how both military air forces were organized, how pilots and aviation mechanics were trained, how and where aircraft were purchased and many other unpublished before details.

The maps included in the book will help the reader have an idea of where aerial operations took place, both combatants air bases, Bolivia's plan to conquer the whole region and how the Paraguayan Army finally expelled the enemy out of the Chaco. The text is supported by a large number of photographs, and specially-commissioned colour profile artworks for modelers.

HELION & COMPANY

ISBN - 978-1-911512-96-7

9 781911 512967